THE ENGINEERING AND MINING JOURNAL

COAL

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## THE MINES OF COLORADO.

The Denver *Republican* in its issue of January 1st, publishes statistics of the production of the mines of Colorado during the preceding year, which in addition to those given in our statistical number, include the value of the gold and silver output of that State, compiled from mint and smelter figures.

The amounts and values are given as follows:

| | Amount. | Value. |
|---|---|---|
| Gold, fine ounces | 218,294 | $4,512,136 |
| Silver, fine ounces | 19,413,788 | 2,0259,906 |
| Lead, tons | 54,596 | 4,749,748 |
| Copper, pounds | 2,396,269 | 359,440 |
| Total | | $29,880,734 |

There is a very considerable discrepancy between these and our own figures concerning the production of lead and copper. We credit Colorado from direct returns by the smelters and refiners in all parts of the country with an output of 62,000 tons of lead and 6,760,000 pounds copper. The *Republican's* statement covers only the returns of the smelters in Colorado, and does not even include all the copper produced by them and marketed in other forms than matte or bars.

The particularly noticeable thing in the figures of the Denver *Republican* is that the production of silver in the State, as well as that of lead decreased, notwithstanding the high prices for both metals, which have ruled during the year. This falling off in the case of silver amounting to no less than 1,675,000 ounces, while even the total value of the lead, copper and precious metal product is less by some $60,000 than in the preceding year.

It would seem from these statistics, then, that instead of the era of unparalleled prosperity which we have heard of in Colorado since the partial exclusion of Mexican lead ores and the rise in the value of silver, the situation of the mining industry in that State has not improved at all. The reason for the decrease in amount of lead and silver output may be in part attributed to the decreasing grade of the ores of Leadville and Aspen, but there must also have been less ore smelted from other parts of the State. These ores are silicious, or contain only a small amount of lead; too little to classify them as lead ores, but they help to swell the grand total of lead output.

## FREE COINAGE OF SILVER.

The advocates of the free coinage of silver have captured the United States Senate by a vote of 42 to 30, and have passed the bill of which the text will be found printed on another page. Outside of Congress there has of late been accumulating evidence, in the influential newspapers of the West and of the East, of a growing opposition to this unwise measure.

The policy of the ENGINEERING AND MINING JOURNAL on this important subject is well known, and is inspired solely by a desire to promote the best interests of the whole country and especially of its wage earners, whether in the silver mines of the West or the cotton factories of the East and South.

The ENGINEERING AND MINING JOURNAL has always earnestly advocated international agreement to fix a ratio of gold to silver at which all the large commercial countries will accept either metal. Under such an agreement silver and gold would circulate together. We have always opposed the policy of the United States undertaking alone to buy all the silver that may be offered in order to raise its value, or, worse yet, to adopt free coinage of silver, which would depreciate rather than advance the market value of silver, and would simply drive gold from circulation and depreciate our money to the level of the commodity bullion, as is now the case in India and other free-coinage countries.

Who would be the gainers and who the losers by free coinage? The gainers at first, at least, would be the great silver producers, such as the rich owners of the Ontario mine, the Granite Mountain and other large producers of the metal, and perhaps especially the swindling Comstock mill ring. The chief losers would be the workmen throughout the country, who would receive the same number of dollars as wages, but they would be depreciated dollars, which would not buy as much as those they now get. No sane man can doubt that the effect of free silver coinage would be to drive gold out of circulation and to advance the prices of many necessaries of life. One would suppose that the Republican party which still holds control of Congress had had sufficient opportunity to appreciate the effect of this upon the votes of the country, and would stoutly resist a course that will aggravate the disaster of November.

The ENGINEERING AND MINING JOURNAL, however, bases no argument on political expediency or party politics. The adoption of free coinage stopping the purchases of silver would no doubt cause a decline in the world's market price of the metal. We are now buying at least all the silver we produce, and this country would before long offer no better market for the metal than free-coinage India. The European markets would still continue to show the market ratio between gold and silver.

It is to be hoped that the House of Representatives, or at least the President, will kill this infinitely mischievous bill and save the country from incalculable injury. That the debtor class, which seems to favor this free-coinage scheme, should ignore the universal experience that capital can always take care of itself and that the losses are finally always borne by the debtors is perhaps the strangest feature of this "craze."

## THE COPPER PRODUCTION AND CONSUMPTION IN 1890.

Notwithstanding the infinite care taken to secure accuracy as well as promptness in the statistics of the metals published in the ENGINEERING AND MINING JOURNAL January 3d, we find that two errors occurred in our copper tables—one through a clerical error in crediting to the Colorado Smelting and Mining Company, of Butte, Mont., the product of another metal by a company having a somewhat similar name, and the other a duplication of a certain small amount of copper treated by an Eastern refining work that had already been included in reports direct from the mines.

The accompanying table gives the corrected figures of the copper production of Montana in detail and of the several States apportioned approximately. This correction of Montana's output, of course, changes the figures representing "consumption" which is estimated by the difference between the exports plus stocks on hand and the available supply.

We have received many congratulatory letters on the subject of this

statistical report, and will here state, in answer to certain remarks made, that we believe the reports of production made to us are strictly accurate. Some incredulity has been expressed as to whether the output of Anaconda reached 64,000,000 pounds, these figures were, however, furnished us by the company.

The distribution of the copper by States is necessarily only approximate, for the source of a good deal of the lead smelters' copper cannot be accurately traced. The totals in such cases are, however, the essential figures, and these are correct.

Stocks, though larger than some well-informed members of the trade expected, are, we believe, substantially correct, and are certainly not excessive considering the rate of consumption. We shall in our next issue publish some communications on these subjects, and will be pleased to receive criticisms or suggestions relating to the figures or facts given by us.

COPPER PRODUCTION OF MONTANA.

| | 1884. | 1885. | 1886. | 1887. | 1888. | 1889. | 1890. |
|---|---|---|---|---|---|---|---|
| Anaconda | 23,000,000 | 36,000,000 | 33,267,864 | 57,000,000 | 63,245,473 | 61,647,000 | 64,046,812 |
| Parrott | 9,300,000 | 9,809,000 | 10,003,080 | 10,000,000 | 10,750,000 | 9,500,000 | 9,000,000 |
| Boston & Mont. | 6,600,000 | 7,500,000 | 2,000,000 | 1,500,000 | 18,278,667 | 26,425,228 | 26,822,804 |
| Clark's Colusa | 600,000 | 10,000,000 | 7,000,000 | 7,100,000 | 700,000 | | |
| Butte Red. Wks. | 2,000,000 | 2,500,000 | 1,700,000 | 1,565,000 | 3,521,556 | 2,560,000 | 3,300,000 |
| Col. S. & M. | | 1,200,000 | 2,000,000 | 1,500,000 | 1,488,000 | 2,951,003 | 2,320,000 |
| Butte & Boston. | | | | | | 1,103,125 | 5,357,723 |
| All others | 4,593,054 | 798,864 | 1,643,621 | 34,677 | 521,295 | 400,000 | 162,661 |
| | 43,093,054 | 67,797,864 | 57,611,485 | 78,699,677 | 98,500,000 | 104,539,353 | 111,010,000 |

PRODUCTION, CONSUMPTION AND STOCKS OF COPPER IN THE UNITED STATES IN 1890.

| | Pounds. | Tons of 2,240 lbs. |
|---|---|---|
| Lake Superior | 99,570,000 | 44,451 |
| Arizona | 33,720,000 | 15,946 |
| Montana | 111,010,000 | 49,558 |
| New Mexico | 870,000 | 388 |
| California | 2,140,000 | 955 |
| Colorado | 6,760,000 | 3,018 |
| Utah | 600,000 | 268 |
| Other sources | 3,900,000 | 1,741 |
| Total from domestic ores | 260,570,000 | 116,325 |
| Total from foreign ores | 6,100,000 | 2,723 |
| Total production | 266,670,000 | 119,048 |
| Stocks beginning of year | 65,000,000 | 29,018 |
| Available supply | 331,670,000 | 148,066 |
| Deduct exports in ore, matte, etc | 50,000,000 | 22,321 |
| Deduct consumption | 202,670,000 | 90,477 |
| Stocks on hand end of year | 79,000,000 | 35,268 |

## REPORT OF EXPERTS ON THE CAPACITY OF THE BROOKLYN BRIDGE.

The report of the Board of Experts on plans for increasing the capacity of the Brooklyn Bridge has just been issued, and it substantially adopts the suggestions made April 5th and 19th 1890, in the ENGINEERING AND MINING JOURNAL.

The report informs us that the traffic for the year 1890 amounted to 37,667,411 persons carried on the bridge cars, or for the day of largest traffic 161,406, and yet it says "it is very improbable that 21,000 persons were carried in any one hour," simply because the facilities for handling passengers were inadequate.

A great number of plans were examined by the Board, which appears to have acted with due appreciation of the vast responsibility attaching to its recommendations.

It is very evident that the ultimate solution of the bridge problem, the attainment of its maximum capacity, involves the provision of terminal facilities equal to the maximum capacity of the road itself, and as this depends simply on the speed of the trains—which has not at all reached its possible maximum—and on the headway interval which need not necessarily be even 40 seconds, it follows that the real maximum capacity of the bridge is limited only by the terminal facilities or the speed with which cars can be emptied and filled.

It is also very evident that the attainment of this maximum requires such a number of tracks to be used successively by the incoming and outgoing trains as will give each train the time necessary for unloading and loading and that this in its turn depends on the number of doors through which exit from or entrance to the cars can be had, and that the unloading and loading should be effected during a single stop of the train.

There are several practical considerations to be observed in the attainment of this ideal limit of capacity. First, it is absolutely essential that the plan adopted should be safe beyond question, and secondly, that it should not involve an exorbitant cost. Thirdly, it should afford the passengers the maximum facilities for using the bridge road. In other words these conditions call for landing stages to be as nearly as possible over the streets by which passengers arrive; for elevators for transferring the passengers to and from the platforms; and above all for absolute certainty of action and safety in the operation of the devices adopted for moving and switching the trains. The several tracks and landing platforms should not call for the acquirement of very much additional expensive land. This condition—absolute safety—appears to have controlled, as it properly should have done, the Board of Experts, hence the measures of relief recommended while calculated to increase capacity, are, so to say, half-way measures involving no radical departure from tried and successful practice. They do not in any sense aim at the ultimate solution of the problem. Extracts from the report, printed on another page, give all its essential features.

As was advocated in the ENGINEERING AND MINING JOURNAL, the Board wisely recommends the adoption of multiple cables on the bridge and of appliances which will permit dropping or picking up either cable at any point. This would avoid many of the annoying interruptions to traffic which have occurred through breaking of the cable, etc.

The advantages of the loop systems using curves of short radii are recognized, and the suggestion of the ENGINEERING AND MINING JOURNAL that the proposers of these systems should demonstrate their efficiency on a working scale before their adoption on the bridge is also endorsed. In other words, the Board points clearly to its preference for the system of the Rapid Transit Cable Company, which appeared also to us to present the greatest advantages yet offered.

Mr. Bryson, engineer of the Rapid Transit Cable Company, has clearly shown that the less headway there is between trains on the bridge, the less is the danger from collision; hence it seems to us to follow that the question resolves itself into providing such a number of tracks or loops as will give time for unloading and loading and starting the cars in the minimum of time. The automatic changing of the switches so that successive trains shall take each its proper track, is a merely mechanical detail of simple order, which can be made absolutely certain and safe in operation. The momentum of the incoming train should, we think, be utilized to aid in passing it around the curve, and but a single stop should be made, namely, on the outgoing tangent. The discharge and taking on of passengers should be through several doors on each side of the car. All the doors on one side of the car can easily be operated simultaneously by the guard on the platform of the car.

From our examination of the subject we believe there can be no doubt about the advantages of the loop over the switching plan now in use, or however modified, a loop or rather a series of loops worked with auxiliary cables is unquestionably the best plan yet suggested for the termini, and the Board of Experts evidently leans toward it. The efficiency of the mechanical details of construction and operation can be demonstrated on an experimental track until the experts are satisfied, when the alterations should be promptly made. The use of multiple cables and a motor car capable of dropping or picking up either cable at any point could be introduced as soon as the necessary independent machinery for working the cables could be put in. There seems now a fair prospect of early relief in this matter which affects the comfort and interests of so many thousands of people every day.

## THE NICARAGUA CANAL.

The announcement a few days ago that the Senate Committee on Foreign Affairs had unanimously reported a bill to guarantee an issue of $100,000,000 of bonds of the Nicaragua Canal Company, has somewhat taken the public by surprise. The steady but quiet manner in which the work was being carried out by the projectors of the enterprise, entailing an expenditure already in excess of $4,200,000, and the good showing made for this expenditure, naturally would lead people to suppose that the Canal Company had sufficient confidence in its own resources to be independent of any Federal subvention. And such was apparently the case; but the money that the Canal Company was, with good reason, depending on to complete the work so auspiciously commenced, was English money and not American. We cannot say whether the step taken by the Committee on Foreign Affairs originated with that body or with the Executive, but it is important to observe, which we do with authority, that it did not proceed from the Canal Company.

The grounds given in the Report to the Senate are sound and rational, and from a national point of view we may look upon the late financial storm in London as having been a fortuitous circumstance for this country. Had it not occurred, in all probability it would have now been too late for the United States to say that they wished to retain control of the canal, which we hope will now be done. That the canal should be American, built with American money, and controlled by the government of the United States, should be made certain. If the present opportunity is not availed of the probable result will be that the canal will be controlled by England precisely as the Suez Canal is controlled by that country.

Although the proposition may startle some people there is nothing novel in it, the importance of this proposed waterway having been patent many years since to some of the most conservative and distinguished statesmen this country has ever seen. Under President JACKSON the Hon. Mr. LIVINGSTON, Secretary of State in 1831, at which date it may be said the project first took tangible shape, instructed our diplomatic representative in Central America in the event of a concession being granted to a Netherlands company under royal patronage for the construction of the canal, as seemed likely at the time. "You will

endeavor to procure for the citizens of the United States, or for the government itself, if Congress should deem the measure constitutional and proper, the right of subscribing to the stock," thus showing the great importance attached to the enterprise by the statesmen of that day, and that the "right of subscribing" was then looked upon as a privilege.

The continual interest shown by the government of the United States has evidenced itself at various dates in repeated surveys of the proposed route, and the work now in progress, and the line of the canal as finally decided on, is the fruit of these surveys.

The question of pecuniary liability is of course one that no prudent government acting as trustee for the nation can overlook, but in this case, although the sum involved does amount to $100,000,000, we cannot see that any real liability or risk would be incurred, either in guaranteeing the interest, say $3,000,000 a year, or in redeeming the principal within the term proposed, viz., 100 years. That the Senate Committee view the matter in this light is clear from the wording of the report, which concludes by saying:

> It is believed by your committee that the United States will not be called upon to pay any portion of the principal or interest of the bonds, but that the work itself will amply repay all its cost and yield its benefits not only to the people of Nicaragua and Costa Rica, but to the civilized world. If it appeared at any time that the interests of the United States are in jeopardy from any cause, it can purchase the majority of the stock and become the controlling owner of the canal by paying its own bonds to an equal amount, and the property, tolls, income, and profits of the canal will be an ample security against the obligations it assumes.

A most interesting report on the prospective tonnage of traffic by Mr. THOMAS B. ATKINS, Secretary and Treasurer of the Maritime Canal Company of Nicaragua, just issued, cannot fail to convince any fair-minded individual that from the day the canal is opened to traffic the tolls will largely exceed the interest and necessary sinking fund upon such a sum as is proposed by the Senate Committee to be guaranteed by the United States. The most careful investigation and study by a statistical commission in Paris in 1879 arrived at 5,250,000 as a "very moderate" estimate of the tonnage existing in 1878 within the zone of attraction of such a canal.

Mr. ATKINS has brought up the statistical work to the year 1889, basing his figures on our own government Reports on Foreign Commerce and Navigation, the English Board of Trade returns, and similar authorities, with the result that his estimate of tonnage of traffic tributary to the canal in the year 1897 actually within the zone of its attraction will reach the sum of 9,934,302 tons. On the supposition that only one-half of this estimate is realized, and on the basis of tolls and working expenses equal to those of the Suez Canal, although in the latter we are aware that dredging is exceptionally heavy owing to drifting and shifting sands, the liability of the United States would be nil.

The committee have taken good care of the national interest, as will be seen from the following clause in the report:

> These considerations led your committee, without division, to the conclusion that it is the interest of the United States to make such a contract with the Maritime Canal Company as would certainly assure the completion of the canal within the period of six years at its actual cost in money, to be represented by bonds of that company guaranteed by the United States, which in any state of the money market would be sold at not less than par, the United States to be indemnified against liability on its guaranty by a pledge of the majority of the capital stock of the company with power to vote such stock. Thus, without loss to the United States, it would secure the early and complete construction of the work at its actual cost, and such reasonable control of the transit as would give to our citizens at least equal advantages in the use of the canal.

## THE MARKET FOR LEAD AND SILVER ORES IN COLORADO.

An event which has aroused the greatest excitement among the silver miners of the Western States, particularly in Colorado, and one which is likely to continue to do so for some time to come, is the stand which the smelting companies have taken in the ore market. The smelting charges *demanded* for many classes of ore have been materially increased, directly or indirectly, while at the same time there has been shown a decided disinclination, which recently became even a positive refusal, to purchase certain grades of ore at all; this, of course, causing indignation in the miners, from one end of the State to the other, who resent such proceedings as purely arbitrary and unwarranted on the part of the ore buyers. The smelters, however, seem to have good reasons for their action, which they claim to be absolutely necessary to the profitable pursuance of the silver-lead smelting industry. So far from there being any chance of a return to the old schedule, under present circumstances, the smelting companies are likely to still further fortify their position.

The facts are these: For many years there had been such an excessive competition between the smelting companies in all parts of the West that the charges for ore reduction had fallen so low that the advantages of the market were entirely with the miners. Only those smelting companies whose works were most favorably located and best designed for economical operation could face this killing competition. While the weaker ones had, one after another, given up the struggle, it is notorious that few of the survivors had been able to conduct their business at a reasonable profit upon the capital invested. Efforts had been made several times to form a combination to end this strife among themselves and raise prices to a paying basis, but these, as might be expected, on account of the diverse interests involved, had all failed.

This state of affairs would, undoubtedly, have continued longer had it not been for the legislation of last summer, so strongly urged by the miners of Colorado, and which has borne exactly the results that the ENGINEERING AND MINING JOURNAL predicted at the time. If either of these laws, the one enhancing the price of silver and the other excluding foreign lead ore, had been passed alone, the effect might not have been so disastrous; but the two have operated one against the other, and have led to the present condition of the ore market.

With the rapid increase in the price of silver which immediately followed the passage of the silver bill, the production of silver ores, particularly of high-grade silicious ores, was greatly stimulated, as is shown by the largely increased output of the San Juan silver district, and the smelters, taking all offered, were soon glutted with ore of this character. The production of lead ore, however, did not keep pace with this, but on the contrary declined. The last of the great lead carbonate ore bodies of Leadville which had been the mainstay of the smelters for so long a time were rapidly being exhausted, and the increased price of lead failed to discover new deposits capable of taking their place. Mexican fluxing ore which had paid duty on the lead contained had to be imported into Leadville, the home of the carbonate ores, to keep the smelters going.

As we have already pointed out, the production of lead in the United States in 1890 was less than in 1889 by 3,300 tons; but the fact that the falling off was no more marked, was due to the activity and increase in outputs of the soft-lead districts of Missouri, Kansas and Wisconsin. In the great argentiferous lead ore States, Idaho and Montana, there was a decrease of 6,000 tons, and in Colorado of 8,000 tons. With the partial exclusion of the Mexican ore, amounting to about 13,000 tons of lead, as compared with the previous year, there arose a great scarcity of the necessary silver-gathering element (lead) for the furnace charges.

The result of this and of the accumulated stocks of silicious ore was that it became necessary for smelters to run with a smaller proportion of lead in their furnace charges, with the consequent greater loss of silver in dirty slags.

Incidentally, the cost of smelting was still further increased by the scarcity of rich argentiferous iron-fluxing ores of Leadville, and the smaller margin upon those ores containing less silver, which the smelters were obliged to use. The exclusion of the Mexican ores was not without influence upon this point, either, for they are mostly so rich in iron as to be more than self-fluxing, and in keeping the lead out of the country the iron was kept out as well.

With the cost of smelting thus increased, it was necessary to raise treatment charges, and to cover the greater loss of silver in slags the basis of payment for the silver contents of ores was reduced from 95 per cent. to 92 or 90 per cent., or even less, of the New York price of silver.

In this situation, then, with great accumulations of rich, silicious silver ores in the bins, and correspondingly large debits at the banks, the smelting companies were caught by the pinch in the money market. The banks called their loans; the smelters could not reduce their stocks fast enough on account of the lack of lead ore, and the consequence was that, while the stringency lasted, they were obliged to cease buying and to sell lead at a sacrifice. Silicious ores immediately became such a glut in the market that even the Boston & Colorado Smelting Company, which is entirely independent of the lead-ore question, raised its treatment charges from one dollar per ton upon low-grade ores to three dollars upon those with more than 50 ounces of silver.

All evidence goes to show that the causes of the present situation are as we have outlined them. The talk of its being due to a combined movement on the part of the smelters is sheer nonsense. They have simply been obliged to act as they have, to secure their own salvation. It is undeniable that the smelting companies of this country, the unwilling participants in a Wall street and Congressional scheme of silver speculation, have lost large amounts of money through the fluctuations of the silver market, and it is certain that circumstances have demanded a different stand toward the ore producers. So the latter may expect the maintenance of the present prices as long as the present conditions continue. There may be some talk of the establishment of small local smelting works, to be owned and operated by syndicates of mining companies, but we venture to assert that such schemes will be abandoned upon sober second thought. The miners will have to face the present situation as they have made it, and content themselves with the higher price for silver which for the past six months they have enjoyed.

## BOOKS RECEIVED.

*Pennsylvania Geological Survey.* Atlas of Southern Anthracite Field. Part III. 1889.

*Pennsylvania Geological Survey.* Dictionary of Fossils of Pennsylvania and Neighboring States named in the reports and catalogues of the survey. Compiled by J. P. Lesley, State Geologist. Vols. II. and III., N-Z. Harrisburg, 1889.

*Pennsylvania Geological Survey.* Seventh Report on the Oil and Gas Fields of Western Pennsylvania for 1887-1888. With additional unpublished Well Records. By John F. Carll. Illustrated. Harrisburg, 1890.

## CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

### "Black Manganese."

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Is there any demand for black manganese or what is commonly called "wad?" We have been prospecting on the Colorado Desert for the last nine years and among our finds is an entire mountain of both hard and soft "wad." It is almost entirely pure and we would like to get in correspondence with some one wanting it. If you can put me in communication with some one you will greatly oblige

Yours very truly,

INDIO, SAN DIEGO COUNTY, Cal., Dec. 20, 1890. A. G. TINGMAN.

### The Panama Canal.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Recent telegrams from Bogata to the Isthmus of Panama announced that the committee then urging the Colombian Government to sign a new contract for the construction of the Panama Canal was sure of carrying their proposals into effect. These were substantially as follows:

A company backed by Henry Ehrmann, of Panama, was to be formed, of which Mr. Napoleon Wise was to be a director, they obliging themselves to commence work within twenty-six months, and to complete the canal on the lock system within twelve years. The company was to pay the Colombian Government half a million francs in cash and five million francs in stock for the concession.

The Panama people, like drowning men, catch at this straw of hope, and talk as though the canal were *un fait accompli*. Everything that bolsters up the old hopes is a boon to the Panameños.

The old company, instead of going into bankruptcy and cutting off all expenses, is still keeping about forty foreign employés on the Isthmus—among them a cashier receiving a salary of $10,000 per annum. It augurs badly for the management of a new company to see this continued waste by the old one.

The plan of the new company seems to be to concentrate all work at one or two points where a good showing can be made, and then, after a few months, with something to brag about, to sell new stock wherever credulous investors can be found. PANAMA.

ASPINWALL, Dec. 16, 1890.

### Remedies for the Smoke and Sulphur Fume Nuisance.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of December 20th you published a letter from Butte, asking how to dispose of the vast amount of sulphurous fumes sent out by the copper smelting furnaces.

It seems to me that the only thoroughly economical and practical way of doing this would be to do as we do in the East—make acid. This could be accomplished by a slight modification of the present methods in use by the best types of modern chemical works, where pyrites is used instead of brimstone. Indeed, in many cases probably no change from the furnaces now used would be needed.

A few years ago only certain ores could be used economically for this purpose, but now, with the onward march of improvement and a better understanding of the ores and their capabilities, far poorer and more complex sulphides can be handled with good results.

In the West there is a large consumption of sulphuric acid and sulphates, and they should be made there. There should be no reason why such large amounts of acid-forming materials should be thrown away and the acid which could be made from them bought in other localities.

The sulphur is there, the air with its oxygen is there, the other less important materials can be brought there; the men needed to do the work can be had; and what more is needed? Only the enterprise to bring them together, and from what has been done in other lines we must believe that this exists also. Let us see it.

By this means the noxious fumes would disappear, and what has been a source of nuisance and vexation would become another source of wealth. HERMAN POOLE.

CLEVELAND, O., January 1, 1891.

### Cyanide Process for Extracting Gold and Silver.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: There has been a great deal of discussion going on in your journal concerning the McArthur-Forrest cyanide process. Having had a great deal of experience with it before it bore its present name, it may not be out of place to state a few facts concerning it.

In 1885, Mr. Muhlenberg, of Reading, Pa., and myself discovered that the use of cyanide in amalgamating ores by no means increased the production of amalgam. A series of experiments led to the discovery that cyanide of potassium was a solvent of every known salt of silver; further experiments demonstrated that it was also a solvent of every known salt of gold. We constructed a plant on a small scale, and for nearly eight months conducted our experiments at the imminent risk of inhaling too much of the fumes, and our results were as follows:

A five per cent. solution of cyanide furnished most admirable results; a two per cent. or one per cent. solution furnished the same results, but required from eight to twenty times as long as the stronger solution. Our conclusions were, that while the extraction of both gold and silver was eminently satisfactory, either life was too short to work with a low solution or a forty-acre lot would be required to hold a plant sufficiently large to work on a large scale, while, on the other hand, the treatment with the higher solution was financially unsatisfactory. We filed a caveat in the patent office covering the ground. So far as I know, the claims that are now made for the process, while no doubt true as to the extraction of metal from the ores, and most refractory ores at that, present no advantages financially. It is possible that I may be mistaken, but after having gone through the experiments with Mr. Muhlenberg, and after having exhausted our ingenuity in trying to rebuild a cyanide after the decomposition had taken place, I am very doubtful whether the process can be applied satisfactorily. F. M. ENDLICH.

OURAY, Colo., December 20, 1890.

### Preliminary Plotting.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: As some interest in the rather ancient, but still useful, way of plotting with the printed paper protractor, straight edge and triangles, has lately been shown in your correspondence column, it may possibly be worth while to air a little improvement of mine on the common method.

With a printed protractor and a long ruler a graduation was very carefully drawn on the outer edges of a rectangular sheet slightly larger than an ordinary sheet of plotting paper. For use, the plotting sheet is tacked upon the large protractor sheet, leaving the graduation uncovered all around, and a small cross is ruled with a fine pencil at the intersection of the quadrant limits. Then the plotting is done in the same manner as with the printed protractor, as described many years ago by Gillespie, but without the inconvenience of having to move the protractor from place to place in order to cover a sheet; and the drawing board need be no larger than the protractor sheet. When one protractor sheet has been prepared, others may be copied from it by carefully pricking the graduations through. If there should be any slight inaccuracy in the enlargement by hand from the printed protractor, the errors will be much reduced in plotting, for the plotted lines are always very short compared with the size of the new graduation, especially if the ruler be laid across the whole sheet to opposite degrees instead of merely from one limb to the center. Clearly the accuracy is quite sufficient for compass work. Still it would be very desirable if somebody would publish such protractor sheets, larger than common plotting sheets, with an engine graduation; and the expense ought not to be very great.

The hand-made large protractor sheets have been in satisfactory use for some fifteen years or more. One of my former Japanese assistants, Mr. Kada, eight years ago introduced the improvement in the Pottsville office of the Pennsylvania State Geological Survey, where it was at the time appreciated highly and copied. BENJ. SMITH LYMAN.

708 LOCUST STREET, Philadelphia, Dec. 21, 1890.

### The Heerdegen Water Finder.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In reply to the letter of Mr. Frank Nicholson, General Manager of the Yuma Copper and Silver Mining Company, printed in the last issue of the NGINEERING AND MINING JOURNAL, regarding the location of wells upon their property, I beg to say that the Yuma company made it a condition in our contract that I should examine their property between July 15th and August 15th, and I agreed to the same, not being well informed concerning the climate in that part of Arizona. On my arrival at the mines I found the temperature 155° in the day and 122° at midnight. Under the influence of this intense heat, of course, I was unable to do any satisfactory work. I was not mistaken, however, in my investigations regarding the presence of water, but to determine the precise depth and quantity was, I suppose, an impossibility in view of my physical condition at that time.

Evidently Mr. Frank Nicholson has not read the correspondence which has passed between the company's officials in St. Louis and myself, or has possibly forgotten the purport of it, as in my letter of October 17th I offered to make another investigation within two weeks, and never mentioned the subject of having my traveling expenses paid, though, as a professional man, I naturally expected that they would be.

In my letter of November 5th I repeated this offer, naming the 20th of that month as a suitable date, and as it was hardly to be expected that I should make a special trip to Arizona at my own expense I stipulated for my traveling expenses, though expressly stating that I should charge nothing for my time. In my letter of November 28th I stated that when convenient to myself, in connection with another engagement out West in a short time, I would make another visit to the mines, and in this case without cost to the company, even for my traveling expenses.

Under normal circumstances I am reasonably certain in my indications and wherever artesian water supply is desired my firm still stands ready to sink wells and guarantee sufficient water; in other words "no water, no pay."

As to my glittering testimonials, I may say that I can produce a number of certificates from people of high standing to whom I have rendered valuable services in successfully locating wells.

NEW YORK, Jan. 14, 1891. JOHN HEERDEGEN.

### Direct Combination of Iron and Carbon.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Occasionally doubts have been expressed in your paper as to the possibility of making iron and carbon combine directly. The following experiments by Mr. R. A. Hadfield seem to imply that this direct combination does occur under favorable conditions, for it is difficult to explain their results upon any other hypothesis. The object of each experiment was to determine the effect of stirring graphite into molten steel. The steel was melted in a clay crucible, and the graphite was simply stirred in. In the first case the resulting steel contained the following:

Combined carbon, 1·11%; graphite, 0·; manganese, 1·22%.

In the second case the resulting steel contained combined carbon, 2·45; graphite, 0·09; manganese, 0·97.

In each case about twice as much graphite was added as was actually absorbed. The 2½-inch square ingots worked fairly, and were rolled down to bars 1¼ inches in diameter.

The following results given me by Mr. John Darby point in the same direction:

Starting with decarburized metal containing only about 0·10% of carbon, he has made about 100 tons or more of steel containing 1% of carbon, the recarburizing being effected wholly by means of filtering through gas-carbon. Mr. Darby is perfectly trustworthy.

By the way, I have noticed in the ENGINEERING AND MINING JOURNAL some rather impolite references to Professor Ledebur. His work is once spoken of as "scientific ballast," an expression which I do not understand, but which has a discourteous sound; and I think it is he who is referred to in your columns as a "scientific barnacle." The reason for the

importation of these marine terms into technical literature I fail to fathom. Professor Ledebur is considered very generally in Germany and elsewhere as the foremost present German metallurgical writer, at least as regards the metallurgy of iron. I was glad to find this, long my own opinion of him, concurred in by one of the best, if not the best, known professor at the Bergakademie in Berlin. But, even if his position should not shield him from such treatment in your columns, I agree with Truthful James that "it is not decent for a scientific gent to call another one an ass, at least to all intent." I quote from memory.

287 MARLBOROUGH STREET, BOSTON, Dec. 26, 1890. HENRY M. HOWE.

## THE KUPELWIESER'S MODIFICATION OF THE OPEN-HEARTH STEEL PROCESS

In an article in *Oesterreichische Zeitschrift für Berg und Hüttenwesen*, translated in the *Iron and Coal Trade Review*, Mr. Kupelwieser says that in 1888 he published some calculations showing that in the open-hearth process the use of molten iron from the blast furnace would be attended with considerable saving of fuel, especially when the amount of scrap in the charge is much diminished, as in the pig and ore process. The heat of fusion of white pig iron being 260 calories, and the make of steel where ore alone is used, or with a very small amount of scrap, being about equal to that of the pig iron, the heat brought into the bath by the fluid metal would be at least 260,000 calories per ton. If this has to be furnished by the combustion of fuel of a calorific value of 7,000, as the Siemens furnace only utilizes about 25% of the heat developed, the amount required will be at least 3 hundredweight, and proportionally more with fuel of lower heating power. Since the above date this method has been adopted and regularly worked at Witkowitz in three furnaces, where, owing to local difficulties in carrying the iron from the blast furnaces, an empty Bessemer converter, previously heated, was used as an intermediate reservoir. Subsequently the process has been modified by blowing the blast-furnace metal in the converter for two minutes, when the bulk of the silicon and manganese is removed, rendering it more suitable for the basic lined furnace. The chemical changes are shown in the following analysis:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Silicon | Metal from blast furnace | | | | 0·95 | Metal blown two minutes | | | | 0·26 |
| Manganese | " | " | " | " | 1·77 | " | " | " | " | 0·75 |
| Carbon | " | " | " | " | 3·39 | " | " | " | " | 3·03 |

The amount of heat developed in the blowing is theoretically as follows:

| Per ton of 1,000 kilograms. | | | Calories. |
|---|---|---|---|
| From 6·9 kilogram silicon | | | 42,860 |
| " 10·2 " | manganese | | 15,500 |
| " 10 " | iron | | 8,750 |
| | | | 67,110 |

About one-half of this is, however, lost by radiation, so that the amount added to the metal does not exceed 10% of that brought from the blast furnace; and, as this is subject to further diminution by the losses experienced on the double transfer to and from the converter, the loss and gain of heat probably about balance each other; at any rate the heat added has no particular influence on the working of the open-hearth furnace. The charges at present consist of 90% cast iron, 10% scrap, together with the necessary amount of ore for tempering, and some lime for dephosphorizing. The work is done very rapidly; the three furnaces take from 15 to 18 charges, or an average of 17 in 24 hours, and the fuel used varies from 10% to 12% of the weight of the ingot produced—a result which the author considers as unattained by any previous method of working.

## THE PROPOSED CHANNEL BRIDGE.

M. Renaud, the hydrographic engineer to whom was intrusted the preliminary survey for the proposed bridge across the English Channel, has recently made his report, which is of considerable interest.

From the observations made, M. Renaud has come to the conclusion that the most advantageous line for the bridge is not that fixed on in the original scheme. The line which he recommends is straight. It starts from a point 350 meters northeast of the light to the west of the South Foreland, and it terminates 300 meters northeast of the entrance of the tunnel near Cape Grisnez. Its length is 33,450 meters. The greatest depth of water met with on the line was from 50 to 51 meters, a depth extending only over a distance of 1,700 meters. The length of the bridge along the line now proposed is shorter by 5,150 meters than that suggested in the preliminary scheme. Moreover, it avoids depths of 55 meters, and those lover 50 meters extend only over a comparatively short distance. The soundings show that the submarine soil is solid everywhere, and that there is in no place mud or soft clay.

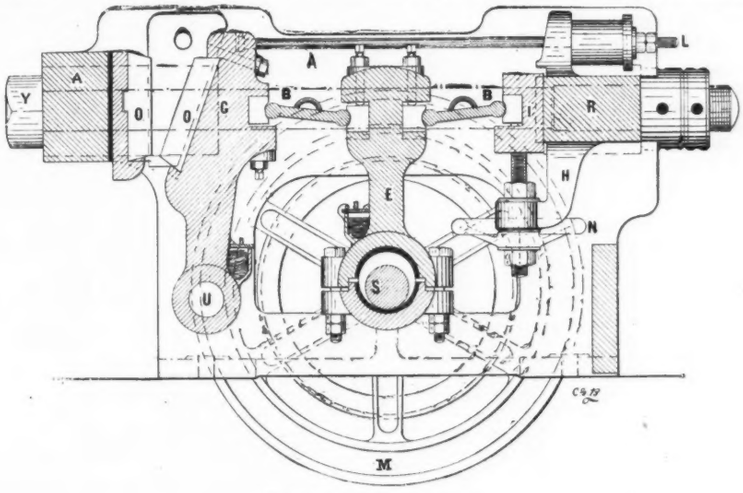
The study of the fauna made for the survey of M. Giard, professor at the Sorbonne and director of the Laboratory of Marine Zoology at Wimereux, near Boulogne, and M. Bouner, sub-director of the same laboratory, proves that between Cape Grisnez and the Colbart only a rocky bottom occurs. The apparatus only brought up animals which live on rocks, and none which live in gravel, sand, clay or mud. From this it is concluded that there is no chance of the Straits ever being silted up. As regards the bridge itself, the line being shortened and the height of the piles diminished in consequence of the greater shallowness of the water over which it passes, considerable diminution of expense is secured as compared with the first scheme. Instead of four millions of meters cube of masonry there will only be three and a half millions. About 50,000 tons of metal will also be saved. Lastly, there will be 92 piles instead of 112, and of these 92 piles 17 will be sunk in depths of 30 to 40 meters, 31 in depths of 40 to 50 meters, and the others in depths of less than 30 meters.

"In summing up the advantages of the new scheme," the report says, "the new line gives greater facility for sinking the piles, a better shelter from the wind and seas from the southwest along the French coast, a slight lowering of the height of the bridge, and a considerable diminution of the masonry and weight of the metallic structure."

## BUCHANAN'S GRANULATOR.

This is intended to be used as an intermediate crusher, between a large breaker and rolls, burr-stones, or pulverizers.

By its use the capacity of the coarse breaker is largely increased, and the wear and tear of the fine crushing machinery is greatly reduced. The machine has double jaws working alternately in order to reduce the strain. As the jaws are very wide in proportion to their opening, it has, therefore, a double throw eccentric shaft, two sets of toggles, and two pitmans. The appended cut is a section through one of the jaws.




BUCHANAN GRANULATOR.

*A* represents the main frame, which is cast in one piece, and is very heavy and strong. *C* is one of the swing jaws, which is pivoted at the bottom on the steel pin *U*. Motion is imparted to the jaws by means of the double throw eccentric shaft *S*, pulley and fly-wheels *M*, pitman *E*, and toggles *B B*. The strain due to crushing is resisted by the large steel tension rods *Y*, passing through heavy lugs cast on the head of the frame *A*, and through holes cast in the movable tail block *R*, which rests in a slot cast in the rear of the frame.

The distance between the jaws, regulating the size of the product, can be adjusted by means of the nuts and jamb nuts on the tension rod *Y*; by screwing or unscrewing these nuts the swing jaw is moved to or from the fixed jaw. For very fine crushing it is necessary to have a short stroke in order to prevent the exit of large pieces, and also to prevent "packing," which is the most frequent cause of breakage in jaw crushers. The Buchanan granulator has an adjustable stroke, which is regulated by means of the adjustable toggle-bearing *I* on tail block *R*, which can be moved up or down by means of the hand-wheels *N*, which are threaded and fitted to a screw, cast in movable blocks *I* and passing through brackets *H* cast on tail block *R*. The threaded hand-wheel is held securely in position by jamb nuts above and below. If the movable blocks *I* are raised the angle of the toggles *B* will be increased, thus increasing the stroke of the jaw *C*, but if lowered the angle of the toggles will be less and the stroke of the jaw will be reduced. The distance between the jaws and the length of stroke can be adjusted while the machine is in motion, which is a very valuable feature. *L* is a rubber spring and spring rod to assist in the back movement of the jaws. The jaw plates *O O* are of chilled iron or hammered steel, and can be inverted when worn. It will be noticed the frame *A* has a large opening around the shaft and pitman bearings so that all parts of the machine are of easy access for oiling or adjustment. The strains on the pitman and frame are all in compression, the tensile strains being on hammered steel of the best quality. All journals are provided with large grease cups or pockets, fitted with spring covers to exclude the dust. A number of these machines are at work giving perfect satisfaction, and accomplishing admirably the purpose for which they were designed. At present only one size is built, viz., 3½ × 30 inches—weighing 10,000 pounds, and having a capacity of from 4 to 8 tons per hour, from No. 4 mesh to one-half inch ring gauge. The granulator is built by the Beckett Foundry and Machine Company, of Arlington, N. J., and was designed by the company's consulting engineer, C. G. Buchanan.

## ORE DOCK OF THE DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY AT MARQUETTE, MICH.—II.

Written for the Engineering and Mining Journal.

An intermediate cap of 12 inches × 12 inches × 26 feet 6 inches, laid upon the 22-foot posts, forms the foundation for the upper deck, the posts of which support the pockets and vary in length according to the floor angle. The three outer posts are tied to the intermediate cap by a double girt of 4-inch × 12-inch × 8-foot pieces (Fig. 7), lapped on each side of the cap and bolted with ¾-inch bolts.

The pocket construction is novel. To this feature Mr. Payne, the designer, gave especial attention, believing that it was possible to construct a pocket equal in firmness of structure to that attained by the old method of construction and securing greater economy of space (see Figs. 4, 5 and 7). The floor at the lower end of these pockets is a steel plate ⅝ inches thick. A layer of surfaced maple plates three inches thick is substituted for the steel on the upper end, as is shown in Fig. 7. These plates overlay two layers of 4-inch pine planks, broken joints, and resting upon the longitudinal 12-inch × 12-inch × 24-foot plates. The steel plate projects through the door and overlaps the hinge end of the chute when the latter is in position for loading. The longitudinal plates above mentioned rest upon the posts of the upper deck. The partitions between pockets consist of 6-inch × 12-inch pine studding placed vertically, resting upon 12-inch × 12-inch rafters fitted into the longitudinal plates, and every third studding is mortised into the rafter, the others being toe-nailed by 8-inch boat spikes and held in position by the upper floor course of maple planking. There is no dead air space in these partitions, the pocket gaining in capacity just what is wasted by such space in the old form of cross-planking on studding, while braces of 3-inch × 12-inch pine extending on either side of the partition from the outer posts under the upper cap, bolted into alternate studding, carried down to the top of the rafters, and re-enforced by additional iron straps (Figs. 4 and 7), give equal if not superior rigidity to the structure. During the season just past, the pockets have been subjected to the severest possible test, and the merits of their peculiar construction are firmly established by the fact that at the end of the season the displacement of the studding is imperceptible. The pocket doors see Fig. 5) are each 3 feet 2 inches × 5 feet in size, made of oak, hung at the top, and latched by a lever and cross-arm device extending across the door and latching into the hanger plates on each side. The dock contains 200 pockets, having an individual capacity of 145 tons.

The dock floor caps of 12-inch × 12-inch × 36-foot timbers, rest upon the partition studding as shown in Figs. 4 and 7. They support the 12-inch × 14-inch stringers that carry the rails of the two three-rail tracks. The floor material is 4-inch hemlock planking laid transversely. The arrangement of the rails (Fig. 7) is such that the center rail on each side does double duty, making in effect four tracks of standard gauge. The center walk is 4 feet 11 inches wide; the outside walks each 4 feet 8 inches wide. Between the rails are two dumping spaces 3 feet 9 inches × 11 feet for each pocket (Fig. 8.) By filling the inner space first, wear and tear on the pocket floor and labor in trimming the pocket, are reduced to a minimum. The filling of the pockets is completed from the outer track.

The chutes (see detail plans, Fig. 3 and Figs. 2, 5, 6 and 7) are made of ¼-inch steel plates. Each chute complete is 21 feet 1½ inches long, verging from rectangular shape at the hinge end to semicircular form throughout the greater portion of its length, with a diameter of 3 feet 3 inches at the mouth. Its weight is 2,500 pounds. The chutes are hinged by 1½-inch × 7½-inch hinge pins to trapezium-shaped hanger plates of steel, weighing each 285 pounds (see Figs. 2 and 5), bent around the door posts to which they are fastened by three-inch lag screws. Plates *A* and *B* (Fig. 3) are the outside plates of the chute. Plate *A*, rolled into shape, is 61½ inches × 15 feet × ¼-inch. Plate *B*, 6 feet 7½ inches × 73 inches × ¼-inch, is cut into the proper shape to form the hinge end of the chute when rolled into shape. This plate is re-inforced by a ⅝-inch steel ear plate, and a ⅝-inch × 3-inch steel strap around the under side of the chute at the hinge end. Plates *A* and *B* are butted together after being rolled into form, and riveted by 68 ¾-inch countersunk rivets to a ⅜-inch × 10-inch steel strap which laps 5 inches under each plate. To give the chute proper height as well as additional strength at section *A B*, plate *C* is riveted to each side of plate *A*, overlapping plate *B* 5 inches and riveted to it. Inside of these plates is a false bottom of steel in two ¼-inch plates, one 42 inches × 15 feet, and the other 42 inches × 6 feet, butted together and bolted with countersunk carriage bolts. Angle plates 2½ inches × 2½ inches are riveted on either side of the chute at the top edge, giving it a neat finish as well as strength. There are also two circular angle plates, one 18 inches from end of chute and the other at the center of plate *A*. These give the chute additional strength and counteract the tendency to crush together at the end and buckle near the center under the great weight of ore. The connection with the hoist is effected by a 5-foot long bail chain of ⅝-inch steel (Fig. 5) and a wire tiller rope. Its various positions are well exhibited in Figs. 7.

For handling the chutes, the Union hoist and counterbalance, patented by Capt. Rich, of Minneapolis, and manufactured by Pettibone & Milliken, of Chicago, are used. This hoist consists essentially of a double crank geared to a shaft bearing a large and a small drum. A heavy

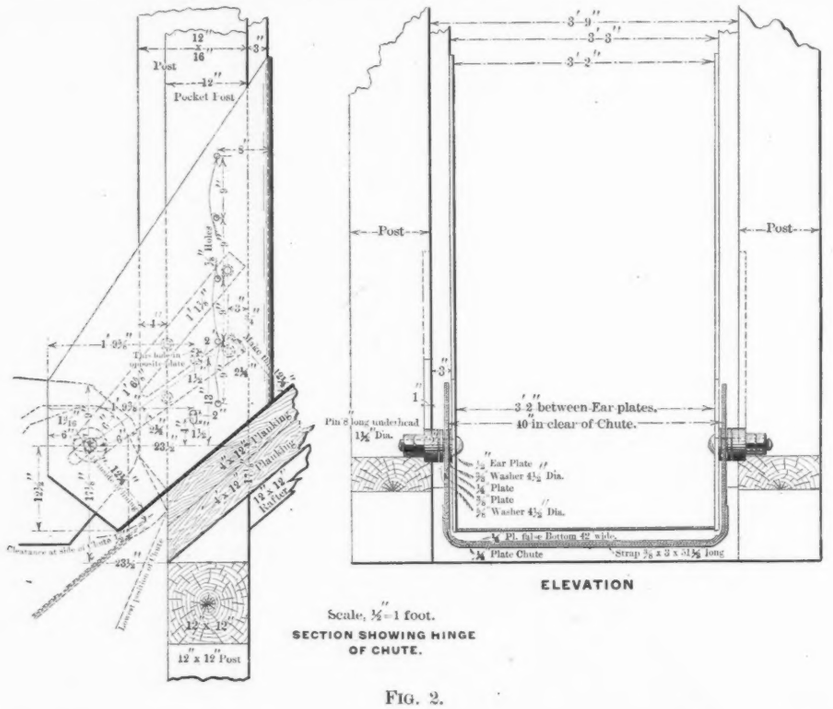



FIG. 2.

weight suspended near the center of the dock (see Fig. 7) is connected by a wire tiller rope to the small drum and is adjusted to act as a counterbalance to the weight of the chute upon the larger drum. It is regarded by engineers as probably the nearest perfect counterbalance ever devised. There is only the friction of hinges and gearing to overcome. No. 4 dock at Marquette is the only structure of its class that is equipped with this hoist and counterbalance. The weight of each hoist complete is 1,150 pounds. They alternate in position on opposite sides of the dock (see Fig. 8). The counterbalance consists of a box made of 2 inch plank nailed to 4-inch × 4-inch scantling and is 3 feet × 2 feet 8 inches × 9 feet 4 inches in dimensions, outside measurement. The box is nearly filled with 6,000 pounds of sand and the weight is then nicely adjusted by trimming with pulverized ore on top of the sand. The whole is suspended on a ⅝-inch rod to the intermediate cap near its center by means of a heavy eye bolt. The ⅝-inch steel tiller rope passes from the counterbalance over a sheave (Fig. 6 and 7) to the small drum of the hoist. A clear idea of the operation of the counterbalance is easily obtained by an examination of the cross section, Fig. 7.

The materials and quantities which enter into the construction of the dock are exhibited by the following table:

| | Wood. Ft., B. M. | | Wood. Ft., B. M. |
|---|---|---|---|
| Sills | 137,976 | Stringers | 134,400 |
| Posts | 1,221,289 | Fenders | 178,400 |
| Caps | 119,333 | Approach | 450,000 |
| Plates | 235,400 | Miscellaneous (bulkhead timbers, etc.) | 321,862 |
| Studding | 182,000 | | |
| Rafters | 55,200 | | |
| Bracing | 235,312 | Total | 4,125,000 |
| Planks | 793,828 | Piles | 100,285 lineal feet. |

*Iron and Steel.*—Chutes, hoists, plates and all other heavy pieces, 480 tons. Tiller ropes, bolts, rivets, screws, spikes, washers, etc., etc., 200 tons. Total, 680 tons.

The contract price of the structure complete, with equipments, was $250,000, not including the cost of dredging, which labor was performed under a separate contract, and was done to make the dock accessible to vessels of deep draught. The cost of component parts would be an in

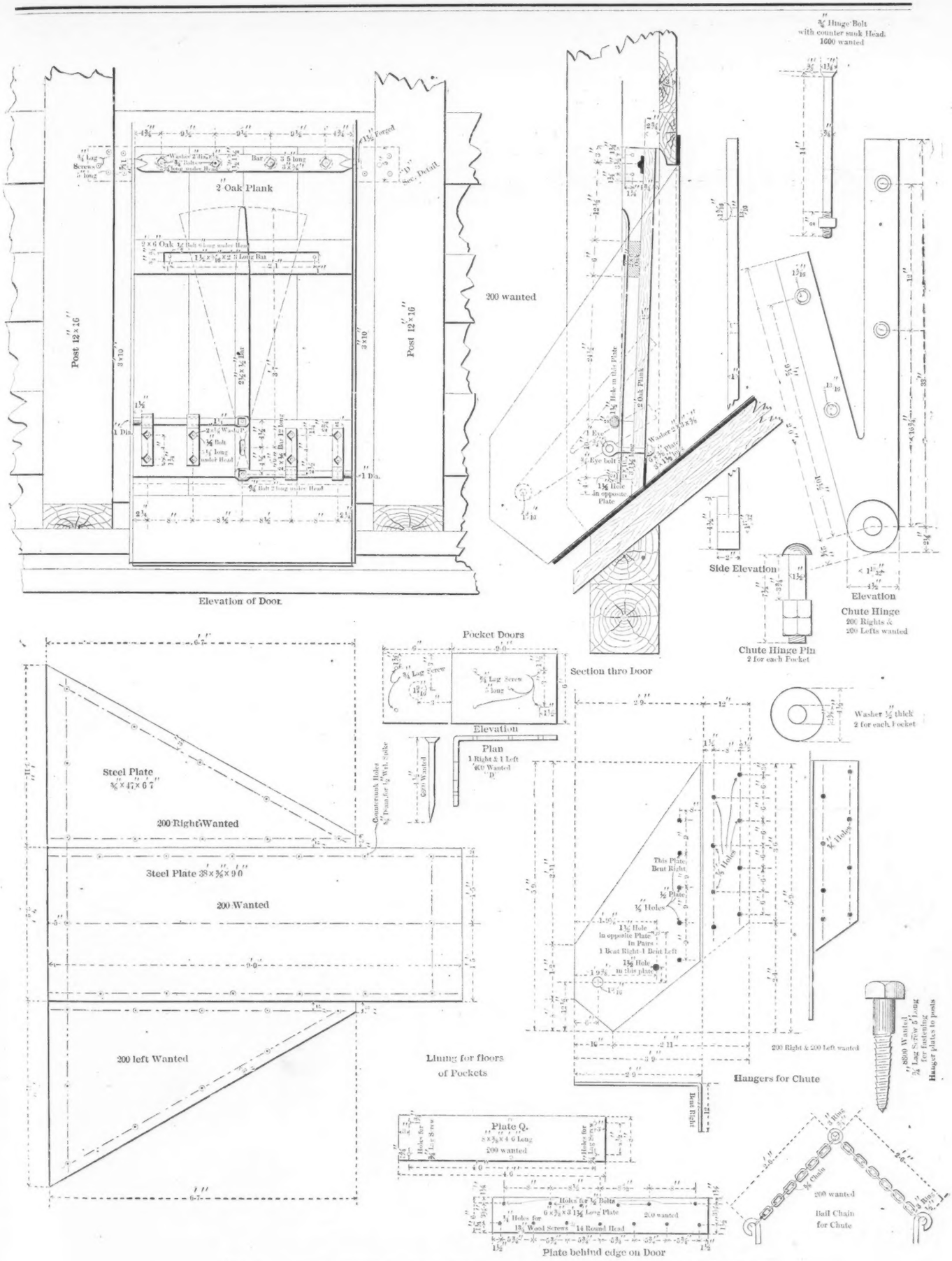



FIG. 5.—DULUTH, SOUTH SHORE & ATLANTIC RAILROAD ORE DOCK, MARQUETTE, MICH.

WEIGHTS OF PARTS IN FIG. 5.

Iron for trap door (bars, bolts and plates), 127 lbs.; steel plate, 38 in. × ⅜ in. × 9 ft., 400 lbs.; steel plate, 47 in. × ⅜ in. × 6 ft. 7 in., right and left, each, 246 lbs.; hangers for chute, 285 lbs.; Plate Q, 47 lbs.; bail chain for chute, 29½ lbs.; hinge bolt, 2 lbs.; chute hinge, 50 lbs.; chute hinge pin, 10 lbs.; washers, 1¾ lbs.; lag screws, 3 oz.; spikes, 4½ oz.

teresting item, but was unobtainable from the railway company and the contractors for obvious and sufficient reasons.

The shipments for the season of 1890, although active, were not sufficiently so to tax the dock to more than one-third of its season's capacity. The insufficient depth of water in the Sault canal operates as a serious check upon Lake Superior commerce. An entire week was lost by a break in the machinery of the canal locks. A further obstacle that continues to exist only by the neglect of the United States Government, and which might be easily removed at comparatively small expense, viz., insufficient room and inadequate protection for its harbor, hinders the natural and inevitable growth of the shipping business of the port of Marquette. Notwithstanding these unfavorable circumstances, the past season's work has been a fair test of the merits of the new dock, enough so to establish its claim to stand as a model for future designers and builders. At brief periods it was taxed quite to its full capacity, but no flaw or weakness was discovered and no interruption occurred. The season's shipments from this dock aggregated 312,159 tons. The season, it must be remembered, was well under way when shipments from No. 4 commenced, late in June. The aggregate was distributed throughout the season as follows:

| | Tons. | | Tons. |
|---|---|---|---|
| June | 9,196 | September | 79,301 |
| July | 69,080 | October | 58,845 |
| August | 69,921 | November | 25,816 |

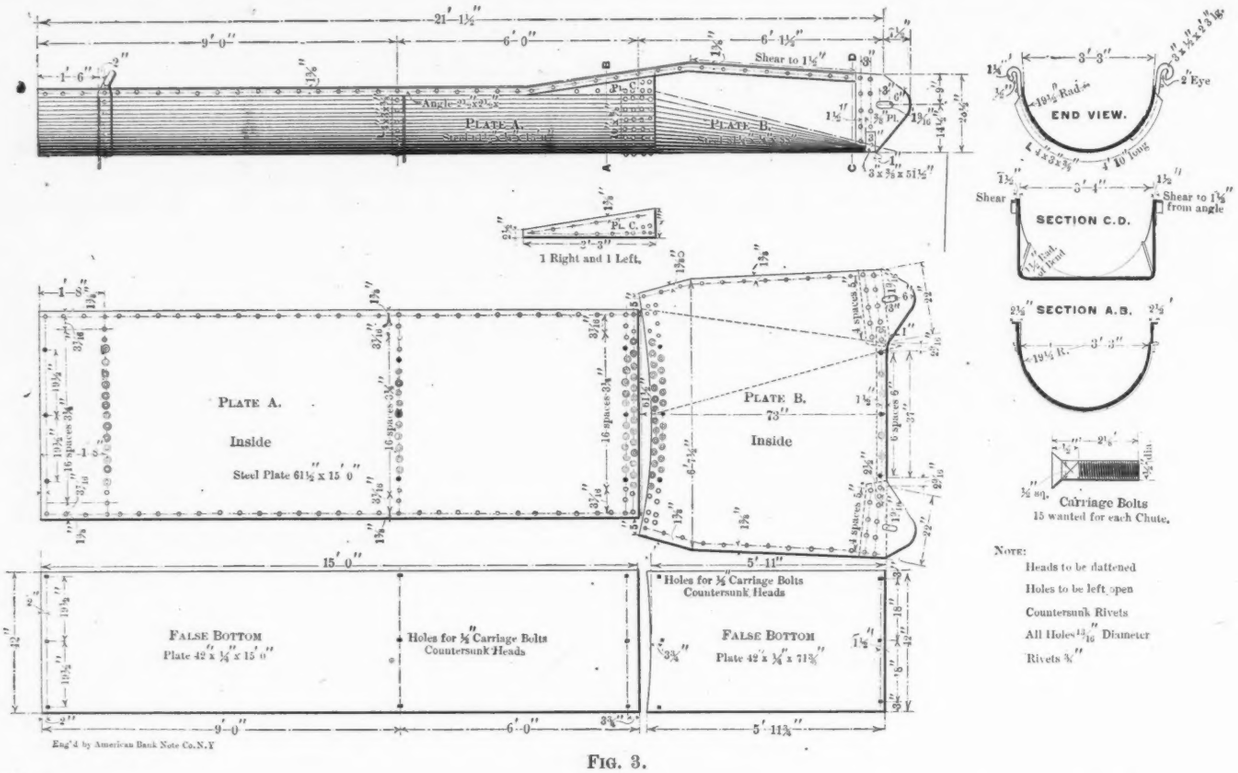



FIG. 3.

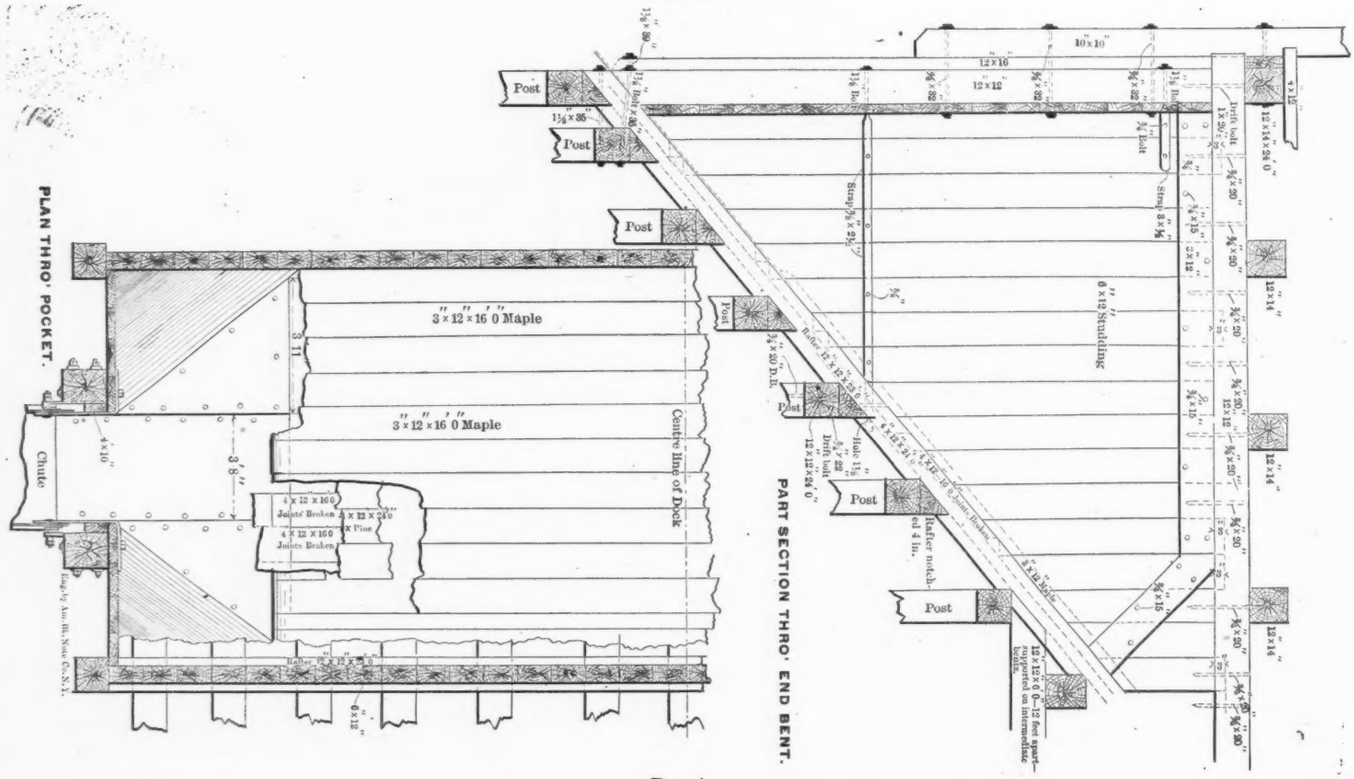

PLAN THRO' POCKET.
PART SECTION THRO' END BENT.
Chute
Post
3 x 12 x 16 0 Maple
Centre line of Dock
6 x 12 Studding
Strap ¾ x 2½
Drift bolt
Hole 1⅛
Batter notched 4 in.
Batter 12 x 12 x 8 0
12 x 12 x 6 0—12 feet apart—supported on intermediate bents.

FIG. 4.

NOTE.—Weight of chute, 2,500 lbs.

The character of the ore handled at this dock, much of it having the consistency of wet clay, precludes the possibility of rapid work. The best record achieved was 2,000 tons in three hours. Name of vessel and date have escaped the memory of the shipping clerks.

During the summer the dock was several times visited by engineers of distinction, who are concerned in the erection of similar structures. Their inspection was minute and critical, and their commendation sincere. Among others were two gentlemen who are interested in the erection of ore docks in Cuba, and the result of their visit was a determination to incorporate the novel and essential features of this structure in their own docks.

## LEADING COAL MEN.

### John F. Wilson.

As much for his jovial good nature as for his large experience and high standing in the coal trade, Colonel John F. Wilson ranks literally as a "leading coal man." He has not been in the coal business all his life, as have most of the other leading coal men, but was in 1866 selected to fill the responsible position of sales agent for the Lehigh & Wilkes-Barre Coal Company, on account of his success in the wholesale coal business in Baltimore for a few years previous.

Mr. Wilson was born in Baltimore, Md., in 1832 and was taken by his parents to Alabama in 1834. There was nothing very exceptional about his youth. He attended public school, and, in his own words, "was about as bad as the worst and about as good as the best," as most boys. In 1849 his father died, and he had to plunge into the stream of work to help support his mother and two younger sisters and two younger brothers. By 1854, when he was 22 years of age, he had attained to the position and emolument of a salesman in a Baltimore dry goods house. In a short time, with his characteristic energy, he worked up a large and profitable connection through several Southern States, where he is well remembered to this day. When the war broke out Mr. Wilson enlisted as a private, rendered good service, and when peace was concluded he retired with a colonel's commission.

JOHN F. WILSON.

Instead of returning to the dry goods business in which he had met with gratifying success, he engaged in the wholesale coal business for a year or two. A short experience convinced him that he had found his proper sphere. It also convinced others of the same fact, and the latter conviction landed him in the position of sales agent which he so ably fills to-day. During his first year he handled about 13,000 tons of hard coal. During the year 1890 he was the main instrument in placing 3,000,000 tons, and so carefully is this immense business conducted that Mr. Wilson has rarely made a bad debt, in fact the losses from this cause by his company are the lowest in the trade.

Mr. Wilson was one of the first to labor for the present agreement among the hard-coal companies' sales agents, which has resulted in so material a benefit to the trade. He has always and stanchly maintained among his colleagues that the output must be restricted to the demand to avert the collapse and demoralization which appeared inevitable a year or two ago.

Mr. Wilson is a social and domestic man and largely known in New Jersey, where he resides. Near Plainfield he lives, and there sinks the coal man in the farmer. He cultivates his farm himself. Mr. Wilson shares with the majority of coal mean a desire to follow in the footsteps of Isaak Walton. He is an enthusiastic fisherman, however, rather than an angler. No pellucid, running stream or brook satisfies him. He must have the active excitement of trolling and fishing in deep salt water, and it may be said of him, as of many other fishermen, that no one has yet impugned his veracity in other connection than that of his phenomenal catches. But this is hardly considered even a venial offense among fishermen.

Mr. Wilson is charitable. It is said of him in the trade, however, that his charity is somewhat impulsive, and not always discriminating, as the following instance—is absolutely true—may prove: One afternoon Mr. Wilson sat in his office when in rushed a decently dressed youth. He had a frank, ingenuous face and a charmingly candid manner. "Mr. Wilson," he said, "you may know me. I've sold papers to you. The man on the corner of This street and That street is trying to sell out his news stand. It's the chance of my life. He wants $25 for it. I've been round among my former customers, and I've raised so much. Will you help me? I don't ask it as a gift, mind you, but as a loan." He got it. A week or so later Mr. Wilson, who had been deeply impressed with the boy's frank and manly demeanor, thought he would hie him to the corner of This street and That street and see how his protégé was progressing in his one chance in life. There was not, nor had there ever been, a news stand there.

A few years ago Mr. Wilson suffered a severe affliction in the loss of his estimable wife. As a mark of devotion to her memory he has since had erected the "Mary E. Wilson Memorial Chapel," at Washingtonville, a village nestling in the mountains some two miles from Plainfield, N. J. There had never been any church within several miles, and consequently Mr. Wilson's gift will remain as much a monument to his own great-heartedness as to the memory of his wife. The chapel is union and unsectarian, served by dignitaries of all denominational churches. The result of this is that the congregation is drawn from many miles around. The Sunday-school is also largely attended. It is one of Mr. Wilson's aims in life to leave enough money when he is called to his fathers, to endow this chapel.

Mr. Wilson, as we have said, is one of the most popular men in the coal trade. With an equable temperament, a jovial disposition and an evident intention to live his life with as little care as possible, it is not surprising that his company is much sought. "It's just as easy to do business under a smile as under a frown, young man," he said to the writer, "and you'll find it a good deal more profitable in the end." And that about summarizes one of Mr. Wilson's chief characteristics.

## NITRATE OF SODA.

The following is an abstract from Mr. F. B. Nichols' report on the nitrate of soda market in 1890:

The consuming interests have been in good condition throughout the year, and the consumption shows a large gain over any previous one, making it evident that low prices and consequent losses were the result of overspeculation on the part of dealers. The cost to import for far forward has fallen to the lowest point of spot value, and while dealers have sought to be relieved, it is reasonable to believe that they have been influenced by the indecision of producers who declared a necessity that has not yet been satisfied. During the year constant efforts have been made to induce the producers to form a syndicate to control the output, and a satisfactory result was said to have been nearly reached, but so far nothing has been settled. It is yet a question whether the mourners in London who bought largely watered nitrate properties, or the more favored officinas holding the richest Caliche, will prevail.

The London interest agreed upon an apportionment, and a committee to settle preliminaries was chosen in November, but the strong holders still believe in the survival of the fittest.

Although four-fifths of the producers have resolved upon a syndicate the price has reached such a point that it is probable that the remaining fifth will succeed in bringing the others to its terms. As a result of this struggle the production has exceeded any previous year, and it is doubtful whether Europe will absorb the increase. The shipments from the coast, not including California, were 726,500 tons in 1888, 933,000 tons in 1889, and 1,040,000 tons in 1890. The European buyers are alarmed at this increase, and demand concessions from the sellers.

The shipments to the Atlantic coast are about 65,000 bags less than in

1889; this fact is encouraging to dealers, as is also the action of the London committee of nitrate producers in appropriating money for the publication of an admirable essay to stimulate the use of nitrate in agriculture. We believe that a further appropriation will be made, and larger development aimed at by the producers.

The shipments to Europe, including the estimate by cable from Valparaiso for December, will be 958,000 tons, against 842,000 tons in 1889, and 658,000 tons the year before.

The deliveries there were 5,842,500 bags, making total for the world 6,642,500 bags, against 5,538,358 in 1889, and 5,227,000 in 1888.

We add a table showing imports and stocks of nitrate of soda in the United States and Europe during the year:

UNITED STATES.

| | 1889. Bags. | 1890. Bags. |
|---|---|---|
| Stock in New York, Boston, Philadelphia and Baltimore January 1st | 86,000 | 51,726 |
| Arrivals in New York from South America | 306,482 | 432,469 |
| " " Boston " " " | 64,346 | 83,742 |
| " " Philadelphia " " " | 63,587 | 103,562 |
| " " Baltimore " " " | 41,288 | 36,413 |
| " " Charleston " " " | 27,582 | 23,381 |
| " " Norfolk, New Orleans from Liverpool | 799 | 8,163 |
| | 590,084 | 739,256 |

| | 1889 | 1890 | | |
|---|---|---|---|---|
| Stock in New York Dec. 31 | 44,726 | 35,454 | | |
| " " Philadelphia | | 3,000 | | |
| " " Baltimore | 7,000 | 3,500 | | |
| | 51,726 | 41,954 | 51,726 | 41,954 |
| Deliveries for consumption | | | 538,358 | 697,302 |
| Price Dec. 31 | | | 1.92@1.95 | 1.70@1.75 |

EUROPE.

| | 1889. Bags. | 1890. Bags. |
|---|---|---|
| Stock in Europe January 1st | 580,000 | 1,477,500 |
| Imports into Europe to December 31st | 5,820,000 | 5,835,000 |
| Stocks December 31st | 1,477,500 | 1,470,000 |
| Deliveries to December 31st | 4,935,000 | 5,842,000 |
| Prices in Liverpool, December 1st | 8s. 6d. | 7s. 6d. |
| Deliveries in United Kingdom, first six months | 530,000 | 680,625 |
| Deliveries on Continent, first six months | 2,637 000 | 3,604,200 |
| Total deliveries, first six months | 3,167,000 | 4,284,825 |
| Average price in Liverpool, first six months | 9s. 3d. | |

## THE ANTHRACITE COAL PRODUCTION OF PENNSYLVANIA.

Abstract from the Census Report of John H. Jones, Special Agent.

The anthracite coal fields of Pennsylvania are situated in the eastern part of the State, and extend about equal distances north and south of a line drawn through the middle of the State from east to west in the counties of Carbon, Columbia, Dauphin, Lackawanna, Luzerne, Northumberland, Schuylkill, Sullivan, and Susquehanna, and known under three general divisions, viz.: Wyoming, Lehigh, and Schuylkill regions. Geologically they are divided into five well-defined fields or basins, which are again subdivided, for convenience of identification, into smaller districts. The production of the State in 1889 by counties was :

PRODUCTION OF ANTHRACITE COAL OF ALL GRADES, BY COUNTIES, IN 1889.

| COUNTIES. | Total product of coal of all grades for year 1889. | Disposition of total product. Loaded at mines for shipment on railroad cars. | Used by employés and sold to local trade at mines. | Used for heat and steam at mines. |
|---|---|---|---|---|
| | Long tons. | Long tons. | Long Tons. | Long tons. |
| Susquehanna } Sullivan } | 351,842 | 319,126 | 5,820 | 26,896 |
| Lackawanna | 8,939,621 | 7,823,694 | 588,535 | 527,392 |
| Luzerne | 16,607,177 | 14,892,324 | 446,036 | 1,268,817 |
| Carbon | 1,210,973 | 1,080,544 | 19,592 | 110,837 |
| Schuylkill | 9,052,619 | 7,837,369 | 181,893 | 1,033,357 |
| Columbia | 628,695 | 539,273 | 15,663 | 73,759 |
| Northumberl'd | 3,176,740 | 2,770,914 | 57,857 | 347,969 |
| Dauphin | 697,485 | 553,632 | 14,184 | 129,669 |
| Total | 40,665,152 | 35,816,876 | 1,329,580 | 3,518,696 |

The total production of anthracite coal in Pennsylvania during the calendar year 1889 was 40,665,152 tons of 2,240 pounds (equal to 45,544,970 tons of 2,000 pounds), valued at the mines at $65,718,165, or an average of $1.61·6 per long ton, including all sizes sent to market. In the above 35,816,876 tons is included unsalable sizes temporarily stocked at convenient points near the mines and tonnage loaded into cars but not passed over railroad scales, as well as waste in rehandling in the various processes of cleaning the smaller sizes. The quantity reported by the transportation companies as actually carried to market, which is the usual basis for statistics of shipments, was 35,407,710 tons during the year 1889; 1,329,580 tons were used by employés and sold to local trade in the vicinity of the mines, and 3,518,696 tons were reported as consumed for steam and heating purposes in and about the mines. The item of colliery consumption, however, is somewhat indefinite, the coal being taken either from the current mining or from screenings and used where needed, often without preparation, and rarely included in the accounts of the operator, being reported to the Census Office in most instances as "approximated." For these reasons it has been excluded from the basis of valuation of the product at the mines.

The average number of days worked during the year 1889 by all collieries was 194. The suspension of mining, during periods aggregating about one third of the year, was caused mainly by the inability of the market to absorb a larger product. The number of persons employed during the year, including superintendents, engineers and clerical force, was 125,229. The total amount paid in wages to all classes during the year was $39,152,124. The total number of regular establishments or breakers equipped for the preparation and shipment of coal was 342, 19 of which were idle during the year. Besides these, there were 49 small diggings and washeries supplying local trade. There were also 18 new establishments in course of construction.

The statistics of anthracite coal in Pennsylvania compiled for the Tenth Census were based upon the year ending June 30th, 1880, and thus covered the last six months of 1879 and the first six months of 1880. The present census covers the calendar year 1889. The following items from the previous census are herewith given to show the developments which a decade has made in this industry.

TENTH CENSUS STATISTICS OF ANTHRACITE COAL.

Total production for census year, including all coal shipped to market and sold to employés and local trade about the mines, exclusive of culm (long tons), 25,575,875; equal to (short tons), 28,640,819; value of product at mines, $42,172,942; average price of all grades per long ton at mines, $1.68; total shipments for census year (long tons), 24,566,822; total shipments for calendar year, 1879, 26,142,689; total shipments for calendar year 1880, 23,437,242; total number of collieries, 275; total amount of wages paid in the tenth census year, $22,664,055; total number of employés, all grades, 70,669.

The largest actual shipment during any year in the history of the trade was made in 1888, being 38,145,178 tons of 2,240 pounds. The largest actual shipment for any one month was 4,187,527 tons, in October, 1888. The largest actual shipments ever made in each of the months of any year to December, 1889, inclusive, show that, if the mines should be operated as actively in each month of the year as they ever have been in that month, the product for the year would be a little less than 40,000,000 long tons. The shipment of 1889 was, therefore, 90% of the maximum shipments practicable under existing conditions. Average monthly tonnage based upon largest shipments ever made, 3,300,984; average annual shipments during ten years ending with 1889. 31,551,301; average annual shipments during five years ending with 1889, 34,390,868.

The following figures show the distribution of anthracite coal for 1889 and shipments since 1820:

DISTRIBUTION OF ANTHRACITE COAL FOR 1889 IN LONG TONS.

Pennsylvania, New York and New Jersey, 22,314,331 or 63·02%; New England States, 5,407,357 or 15·27%; Western States, 4,922,076 or 13·90%; Southern States, 1,613,120 or 4·56%; Pacific coast, 20,900 or 0·06%; Canada, 1,094,736 or 3·09%; Foreign, 35,190 or 0·10%. Total, 35,407,710 or 100·00%.

The initial lines of transportation from the anthracite coal fields are operated by the following companies: Delaware, Lackawanna & Western Railroad Company; New York, Susquehanna & Western Railroad Company; New York, Ontari & Western Railroad Company (in course of construction); Delaware & Hudson Canal Company; Erie & Wyoming Valley Railroad Company; Central Railroad Company of New Jersey; Lehigh Valley Railroad Company; Pennsylvania Railroad Company; Philadelphia & Reading Railroad Company; New York, Lake Erie & Western Railroad Company.

A complete directory of the anthracite collieries of Pennsylvania is given in this report.

## METALLURGY OF STEEL.

*Revue Universelle des Mines* says in its October number: "While steel gradually supplants iron in numerous applications, the majority of writers on this subject consider still the study of the manufacture of steel as an appendix to that of iron. Despite this chronological, and therefore natural, order, this appendix tends to surpass in importance the principal subject. Steel has to-day an independent existence, especially in the vast sense of the term "steel," which is accepted in the Latin and English nations, irrespective of the decisions of the international committee in 1876, adhered to only by some German metallurgists. Steel in this generic denotation is Howe's subject in the important work of which the first part has recently been published in book form after having appeared by installments in the ENGINEERING AND MINING JOURNAL.

Mr. Howe is not personally unknown on the Continent. At the Universal Exposition of 1889 he was United States juror, and availed himself of that opportunity to visit most of the European districts of interest to iron metallurgists. The material he thus collected will undoubtedly make the second volume of his work particularly attractive.

The most salient feature of this book is the painstaking discussion of data furnished by the literature on the subject, or derived from mill experience. To quote an instance, 180 tables out of the 200 in the volume are entirely original in regard to the data they contain, or to the results of the calculations based on them. Mr. Howe is professor at the Massachusetts Technological Institute in Boston; he evidently owes to the habit of teaching the method and lucidity that characterize his work.

After a summary sketch of the classification and constitution of steel, whereby he clearly gives the outlines of what he proposes to treat of, he proceeds to describe [here an enumeration of the chapters follows]. The figures in the text or on special plates number 227, and comprise very many diagrams of mechanical or physical properties that result of various influences on the metal.

We must add that this monograph is typographically dressed with all the luxurious taste to which the Scientific Publishing Company has accustomed us. It is, however, not only the most beautiful book ever published about steel but surely, also, the most complete and thorough."

**Smokeless Powder Manufacture.**—Hitherto the posts of superintendents and managers of the powder factories at Spandau, Germany, have been filled by artillery officers. These are now to be replaced by civil engineers and chemists, says *Industries*, it having been found necessary to employ men possessing special knowledge and training in the manufacture of the new smokeless powder. The production of this powder involves operations demanding high scientific attainments on the part of those whose duty it is to direct them.

**Railway Consumption of Coal.**—The consumption of coal by a locomotive when the temperature is from 8° to 10° below zero, centigrade, has been found to be increased by from 30% to 40% above the normal, says the *Colliery Guardian*. In Belgium the State railways use 750,000 tons of coal per annum, or about 2,500 tons daily; but in cold and frosty weather the consumption increases to 3,500 tons per day. In addition to this, the consumption of coal on frosty days on the Grand Central, the Nord-Belge and the narrow gauge railways is greater by about 1,000 tons, or a total daily increase of 2,000 tons.

## THE BROOKLYN BRIDGE PROBLEM.

There is no engineering question of greater interest to the inhabitants of New York and Brooklyn than the solution of the problem how to increase the capacity of the Brooklyn Bridge, and thereby establish more rapid transit between the two cities. There is some prospect for improvement in the matter given by the recent report to the Board of Trustees.

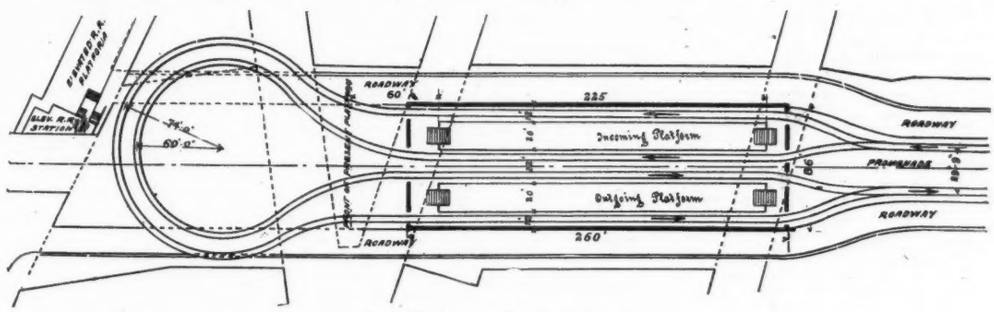
The present capacity of the bridge trains one way is about 16,000 passengers per hour, or 40 trains of four cars each, with one minute and thirty seconds headway and 100 passengers per car.

To increase this capacity it is necessary either to reduce the headway or to increase the number of cars per train. Numerous and widely different opinions and suggestions have been presented as to both. These have all been considered and weighed by the Board, with the unanimous conclusion that the relief must be sought rather in the increase in number of trains—that is, by the reduction of headway—than in the number of cars per train.

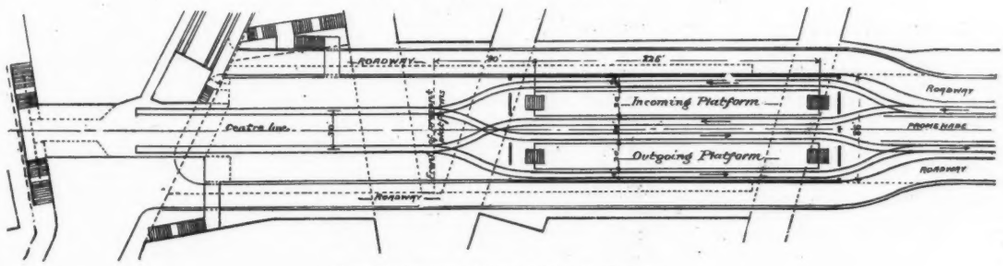
Nothing has been more thoroughly demonstrated in railway practice than that when regularity and promptness are required—and on the bridge they are essential to success—shortness and lightness of train are important elements. It is doubtful whether it will ever be desirable to run trains of more than five cars each upon the bridge, and for the present it is believed that the best results can be obtained with four.

If this be true, then more than forty trains per hour must be dispatched from the termini, and the problem is to recommend a plan for terminal stations which will enable the trains to be dispatched at the minimum intervals of time and space at which they can be moved regularly and safely across the bridge. When this is accomplished the maximum capacity of the railway will be reached, and no alterations of terminals should provide for less.

The loop systems, particularly for the New York terminus, possess many attractive features, such as the reduction of the number of switches, the dispensing with locomotives and with switching tracks over the street, the loading of trains in the same position in which they are unloaded and the keeping of the current of car movement always in one direction, without switching. No device has been submitted to the Board, however, for the operation of cable trains around such a loop which ha been sufficiently developed in practice to warrant its adoption now. It is quite clear that the main cables cannot be used around such loops.




THE PROPOSED LOOP SYSTEM.




THE PROPOSED NEW YORK TERMINAL.

To locate the platforms on straight lines parallel with Park row and complete the loops involves the purchase of such large amounts of expensive real estate as in the judgment of the Board to be prohibitory, and to locate a sufficent number of platforms on curves of such short radius as to reduce the cost for real estate to within moderate limits seems entirely impracticable.

The headhouse system, so called, would have many advantages for the New York terminus in bringing the platforms nearer to Park row, but the delays, to say nothing of the possible dangers, in switching loaded trains in the face of each other and over the necessary crossings, forbid its serious consideration where trains are moved by cable power approaching the station on a descending grade of over 3%.

This leaves but one system of terminal handling—substantially the one now in use—to be considered. It is the only one which experience has justified in the operation of the bridge railway. This railway is the only one which has successfully operated a cable line upon heavy grades with trains of four cars and of more than eighty tons in weight, and it is probably carrying safely more persons per day, and per hour at certain periods of the day, between two given points than any other transportation line in the world. The plant should be so enlarged, and parts duplicated, as not to be overtaxed by more than double the present traffic.

Looking at all these facts, the Board unanimously recommends:

1. That the terminals be enlarged, both in New York and Brooklyn, the incoming and outgoing platforms to be not less than 20 feet in width and 225 feet in length, with a track on either side of each.

2. That two gauntleted tracks be laid on each line of railway, the one leading to the north side and the other to the south side of the incoming and the outgoing platforms respectively, thus avoiding the regular use of switches by loaded trains and reducing to the minimum the possibility of derailment from broken tracks.

3. That two cables be used—one for each track of the gauntlet—both to be run regularly during the busy hours of the day, and the second one, when not in use, to be kept ready for immediate service in case of accident or other emergency. These two cables should be operated by entirely separate machinery, so that the efficiency of one is in no way dependent upon any part of the apparatus connected with the other.

4. That as soon as possible the grip apparatus be so arranged that the cable can be dropped and picked up at any point on the line.

5. That the tracks at the New York terminus be raised to improve the grade approaching the platforms, and to admit of a large waiting-room and entrance hall beneath: this waiting-room to communicate by wide platforms and passageways with the bridge to City Hall Park, the Manhattan Elevated Railway station and the entrance from Park row and William street, and to furnish an inclosed place in which passengers can in comfort wait, either from choice or necessity.

It is recommended also that elevators be put in at Rose street, connecting with this waiting room, as an inducement to passengers coming from between the bridge entrance and the East River to enter the station at the east end and take the front cars which are farthest removed from Park row. It is believed that this will add largely to the bridge travel. Two elevators, of a capacity of 50 persons each per minute, or 6,000 per hour for two, will be sufficient at present, but the plans should provide space for two additional ones, to be built when needed.

6. That the whole of the triangular block north of the bridge and between North William street and Park row be acquired by the bridge trustees and the Manhattan Railway Company in such proportions as may be agreed upon, and the part not required for the enlargement of the Manhattan Company's City Hall station be used jointly as a means of communication between the two railways and for access to the bridge trains, roadway and promenade on the north.

7. That the foot bridge to City Hall Park and the stairways thereto be widened.

8. That the Brooklyn station be located between High and Sands streets, adjacent to and parallel with Washington street, and that sufficient property be acquired for yard and storage purposes in extension of the present yard up to Tillary street.

This location is suggested because it accommodates with least change all the transportation lines which bring traffic to the bridge; it requires less outlay for real estate than any other convenient and suitable one, and it accomplishes the object with least possibility of conflict and delay.

9. That as a means of affording needed access to the bridge for all classes of its traffic, the entire block bounded by High, Sands and Fulton streets and the bridge station should be acquired and opened as a plaza, and that Liberty street be widened to 80 feet and extended as shown on plan 2.

The location of the station as proposed would enable the Union Elevated Railroad to maintain its connection with the bridge substantially as now.

The plaza would afford ample ingress and egress for the roadways and suitable terminals for all the Fulton street surface railways, and the connection with the Kings County elevated line could be made by overhead gallery from Fulton street, or, better still, the tracks of that company could be placed upon Liberty street from Tillary street to the station, and a shorter footway for passengers thus obtained.

10. That the improvements be made without delay.

The Board believes that these plans if adopted will meet all the substantial requirements of the case at the minimum outlay for property. The headway between trains can be reduced to 45 seconds, increasing the capacity of the railway with four-car trains from 16,000 to 32,000 passengers per hour, or with five-car trains to 40,000. If, as is possible, the

headway can be made 40 seconds the capacity for four-car trains will be 36,000, and for five-car trains 45,000 per hour, assuming that passengers insist upon crowding the trains to the extent of 100 per car rather than wait.

These proposed improvements are illustrated by the accompanying cuts.

Before this limit is reached the growth and distribution of the population in the two cities will be such as to demand other means than this one bridge for quick transit between them, and the problem will likely have assumed such different phases that no calculations upon it now would be of much value.

Until the tail switching into the street can be eliminated it is not believed that any desirable or suitable building can be erected at the bridge terminus on Park row from which rentals can be obtained; but such a building, with the locomotives dispensed with, could and should be made not only a handsome and fitting portal to the bridge, but also a source of revenue from expensive real estate necessary for the purposes of the bridge but otherwise unproductive.

## TEXT OF THE FREE COINAGE BILL ADOPTED BY THE U. S. SENATE.

SECTION 1. That from and after the date of the passage of this act the unit of value in the United States shall be the dollar, and the same may be coined of 412½ grains of standard silver or of 25·8 grains of standard gold; and the said coins shall be legal tender for all debts, public and private; that hereafter any owner of silver or gold bullion may deposit the same at any mint of the United States to be formed in standard dollars or bars for his benefit and without charge; but it shall be lawful to refuse any deposit of less value than $100, or any bullion so base as to be unsuitable for the operations of the mint.

SEC. 2. That the provisions of Section 3 of an act to authorize the coinage of the standard silver dollar and to restore its legal-tender character which became a law February 28th, 1878, are hereby made applicable to the coinage in this act provided for.

SEC. 3. That the certificates provided for in the second section of this act shall be of denominations of not less than $1 or more than $100; and such certificates shall be redeemable in coin of standard value. A sufficient sum to carry out the provisions of this act is hereby appropriated out of any money in the Treasury not otherwise appropriated. So much of the act of July 14, 1890, entitled "An act directing the purchase of silver bullion and the issue of Treasury notes thereon, and for other purposes," as requires the purchase of 4,500,000 ounces of silver bullion per month, be and the same is hereby repealed.

SEC. 4. That the certificates provided for in this act and all silver and gold certificates already issued shall be receivable for all taxes and dues to the United States of every description, and shall be a legal tender for the payment of all debts, public and private.

SEC. 5. The owners of bullion deposited for coinage shall have the option to receive coin or its equivalent in the certificates provided for in this act, and such bullion shall be subsequently coined.

**According to the census** recently made in Japan, the population is 40,702,020, an increase of 464,736 in two years. Of these 3,825 are nobles and members of noble families; 1,9 3,637 are members of the Shizoku ("military, next to nobles"), and 38,070,558 are common people (Heimin. Japan has two cities of more than a million inhabitants—Tokyo, 1,138,546, and Osaka, 1,203,395. Japan has 7,840,872 houses, an increase of 38,046 in two years.

**The Mica Industry in South Australia.**—Deposits of mica have been discovered in the northern part of this colony, and a shipment of about one ton is now on the way to Port Adelaide. This consignment is from the Benstead-Palmer claims, and the sizes are extraordinary, running up to 24 inches by 12 inches, and averaging 12 inches by 9 inches. One piece was 32 inches by 10 inches, but had to be cut into two pieces. The value of mica sheets of this size in London is about 15s. per pound.

**The Silesian Nickel Deposits.**—The newly discovered deposits of nickel and chrome ores near Frankenstein, in Silesia, are turning out to be very rich, according to the Berlin correspondent of the London *Industries*. Herr Krupp has ordered the immediate delivery of 100 tons of nickel ore, 20 tons of which have already been despatched from the mine. Herr Krupp has, it is said, offered 1,500,000 marks for these mines. The discovery of these deposits is an important event in the history of the German iron and steel industry in view of the rapidly increasing importance of nickel steel.

**Christomanos' New Melting-point Apparatus.**—An improved melting-point apparatus has, according to *Ber. Bert. Chem. Ges.*, xxiii, 1093, as abstracted by the *American Journal of Science*, been devised by Christomanos, consisting of a two-necked bottle containing mercury, which can be heated in an air bath. Through one of the openings a thermometer passes and also a wire from a voltaic cell. Through the other passes the drawn out end of a glass funnel. The substance to be experimented upon is placed in this funnel in the fused state and allowed to solidify. The space above it is then filled with mercury and the funnel is introduced in the bottle. The second wire from the battery connects, through a vibrating bell, with the mercury in the funnel. Upon raising the temperature of the bottle to the fusing point of the substance, contact is established between the two portions of mercury and the bell is made to ring. The temperature of the mercury in the bottle is then noted.

**Marey's Photochronograph.**—The *American Journal of Science* gives the following abstract of a description of a photochronograph in *Comptes Rendus*, November 2d, 1890. Mr. Marey attaches to one end of a long band or ribbon of sensitive film a band of black opaque paper and to the other end of this film a similar band of red paper. The film is then rolled upon a bobbin beginning with the end of the red band. This operation is conducted in the dark room. The bobbin can afterwards be taken into the light, being fully protected by the black and red bands of paper. When one wishes to take a number of photographs of a rapidly moving object, the bobbin is introduced into the photographic apparatus. One end of the band rolls upon an empty bobbin, and at the end of the operation the film is protected by the band of red paper. While the portion that is not exposed to the light is still covered with the black band, one can thus readily distinguish between the portions of the bobbin that have been exposed to light. The apparatus makes it possible to take a number of images upon the same band, and consequently to submit them all at once to the same developer.

**How Electricity is "Stored."**—The energy which a current may at any instant be said to possess is immediately transformed into heat in the circuit, which will under certain conditions produce light; into chemical energy; into motion, which may or may not produce sound; or into magnetic and electrotonic conditions. The last may either be permanent or have the same evanescent existence as the original current. When electricity is employed to charge a storage battery, only that part which is transformed into chemical energy is used. The rest is dissipated. The battery, then, instead of being a place where electricity is laid away, is a place where chemicals are left by the current, with the expectation that they will in turn produce a current when called upon. This may seem a fine distinction, but it is only apparently so. For instance, the current might be produced by a dynamo turned by Niagara water power. The chemical left by it might be zinc deposited from a solution of zinc sulphate. This might be transported, preserved, bought and sold, and finally be employed by some physicist to produce another current. Were the electricity itself stored in its original form, then the imaginative reader can best tell what would become of it and how it must be handled.—*Popular Science Monthly.*

**The Relation of Cupric Chloride Solutions to Heat.**—Articles in *Zeitschr. physikal. Chem.*, v, 559, and *J. Chem. Soc.* lviii, 1206, November, 1890, the *American Journal of Science* condenses, as follows: From thermo-dynamical considerations it follows, as Le Chatelier and Van't Hoff have pointed out that when the heat of solution of a substance in its almost saturated solution is negative, the solubility will increase with rise of temperature; while when it is positive the reverse will be the case. Reicher and van Deventer have tested this conclusion for cupric chloride $CuCl_2 . (H_2O)_2$, one of the few salts which dissolve in much water with evolution of heat, its temperature coefficient of solubility being positive. Consequently a remarkable behavior should be observed with this salt with respect to the heat of solution in liquids of different concentration. The authors find, as theory predicts, that in a saturated solution the heat of solution is negative. From thermochemical data given by Thomsen on the heat of dilution of solutions of cupric chloride joined to data of their own, the authors calculated that at 11° the heat of solution attains a maximum when the solvent has a strength of about eight molecules of $CuCl_2 . (H_2O)_2$ to 198 molecules of water. At this concentration, therefore, the salt would be dissolved without any thermal effect whatever; and experiment shows this to be the fact. When the concentration is about 18 molecules of the salt to 198 molecules of water, the heat of solution becomes negative.

**On the Action of Zinc on Dilute Sulphuric Acid.**—The curious intervention of a third substance in chemical reactions has long been noticed. In the absence of moisture, for example, phosphorus may be distilled unchanged in oxygen, and, in the absence of nitrous acid, nitric acid has no action upon either silver or copper. From this standpoint Pullinger has according to *J. Chem. Soc.*, lvii., 815, as abstracted by the *American Journal of Science*, studied the action of zinc upon sulphuric acid. The zinc was purified by three distillations in vacuo, in a tube of hard glass. The acid was purified by diluting with three times its mass of water and boiling for six hours in a flask provided with an inverted condenser. A sphere of zinc, 1·25 grams in mass, lost in this acid of specific gravity 1·179, only five milligrams in sixty minutes. The conclusions of the paper are as follows: (1) Pure zinc, with a perfectly smooth surface is not acted on by dilute sulphuric acid which has been submitted to prolonged boiling; (2) pure zinc with a rough surface is readily acted upon, but in a less degree by acids which have been boiled than by those which have not; (3) oxidizing agents such as electrolyzed sulphuric acid, hydrogen peroxide and nitric acid, increase the rate of solution; (4) reducing agents such as hydriodic acid almost entirely prevent solution, those containing sulphur, however, like sulphurous oxide, being without effect; (5) it is not improbable that when zinc with a rough surface dissolves in dilute sulphuric acid, persulphuric acid acting by its presence is the cause of the solution; and (6) in all probability *pure* dilute sulphuric acid at ordinary temperatures would be entirely without action on metallic zinc whether the surface of the metal were rough or smooth.

## PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent Office:

TUESDAY, JANUARY 13TH, 1891.

444,439. Railroad Tie. John W. Hollin and Thomas B. Smith, New Richmond, Ind.
444,476. Coal Mining Machine. Christopher H. Wolford Corry, Pa., assignor of one-half to James A. Anderson, Bedford, O.
444,481. Process of Cleaning Boilers. John M. Boyer, Cincinnati, O.
444,549. Gang Drill Rock Channeling Machine. Albert Hall, Claremont, N. H., assignor to the Sullivan Machine Company, same place.
444,550. 444,551. Apparatus for Coiling Wire Rods. Fred H. Daniels, Worcester, Mass.
444,563. Valve Gear for Engines. Ellis J. Woolf, Minneapolis, Minn.
444,568. Apparatus for Making Tubing. Peter Patterson, McKeesport, Pa., assignor to the National Tube Works Company, same place.
444,569. Apparatus for Welding Tubing. Peter Patterson, McKeesport, Pa., assignor to the National Tube Works Company, same place.
444,578. 444,579. Lengthening Metallic Beams and Girders. Peter H. Jackson, San Francisco, Cal.
444,592. Hoisting Machinery. Benjamin W. Grist, Philadelphia, Pa.
444,602. Transit Instrument. Clinton Sutphen, New York, N. Y., assignor of one-half to Eugene H. Hinton, same place.
444,614. 444,615, 444,616, 444,617, 444,618, 444,619. Machinery for Centrifugally Treating Particles of Metallic or Mineral Bearing Substances. Orrin B. Peck, Chicago, Ill., assignor to Melinda Peck, same place.
444,652. Apparatus for Coiling Metal Rods. Henry Roberts, Pittsburg, Pa.
444,679. Dioxynaphthaline Mono-Sulphuric Acid. Moritz Ulrich, Elberfeld, Germany, assignor to the Farbenfabriken, vormals Fr. Bayer & Co., same place.
444,692. Boiler Pedestal. Allen P. Creque, New York, N. Y.
444,693. Stand or Support for Boilers. Allen P. Creque, New York, N. Y.
444,699. Safety Valve Gear for Steam Engines. Noble T. Greene, Providence, R. I.
444,713. Water Alarm for Steam Boilers. Seymour E. Roberts, Oneida, and James E. Lathe, Vernon, N. Y.
444,731. Means for Storing and Handling Petroleum Oil. Luther C. Snell, Detroit, Mich.
444,785. Ore Concentrator. Frederick C. L. Sergeant, Denver, Colo.

## PERSONALS.

Capt. John Pitman, Ordnance Department, U. S. A., has been ordered to the Watervliet arsenal, West Troy, N. Y., on duty in connection with the construction of guns.

Mr. Clarence E. Stump, business manager of the *Electrical World*, New York, for many years past, has accepted a similar position with the title of vice-president, in the Street Railway Publishing Company.

The ironmasters of the Birmingham district who accompanied the members of the Iron and Steel Institute in their recent visit to the United States, celebrated the event by a dinner at the Queen's Hotel, Birmingham, on Wednesday, January 7th.

A dispatch from Düsseldorf, Germany, states that the German Iron Works Union has appointed a committee to visit Mr. Phelps, the United States Minister at Berlin, to arrange for a substantial testimony of gratitude to the American Institute of Mining Engineers for the courtesies shown the 150 delegates of the Union who visited the United States in October.

The Butte *Intermountain*, Butte *Miner*, Pueblo *Chieftain*, Leadville *Herald-Democrat*, Colorado Springs *Gazette*, and Denver *Mining Industry and Tradesmen*, published enlarged numbers at the first of the year, with valuable statistics and interesting reviews of the mining and smelting industries in the respective districts which they represent.

It is said that Speaker Reed has at last appointed the Special Committee of the House authorized by Representative Dockery's resolution to investigate the Congressional silver pool. He has selected Messrs. Dingley, of Maine, Chairman; Payne, of New York; Rowell, of Illinois; Oates, of Alabama, and Peal, of Arkansas. Mr. Oates and Mr. Rowell have had wide experience in conducting investigations, and are reckoned among the ablest lawyers in the House.

Mr. Justin Suberbie, of the firm of Suberbie Bros., an old established mercantile firm of Madagascar, has been spending a short time in San Francisco, Cal, preliminary to making a tour of the State for the purpose of studying the methods of placer, hydraulic and quartz mining. His firm has received a 60-year grant of a large tract of land in the western portion of the island, and having been moderately successful in working a quartz mine, it has felt warranted in extending operations. Mr. Suberbie has ordered a complete plant of hydraulic mining machinery, which will be dispatched in charge of a competent man to Mevatanna.

Mr. Ferdinand Schlesinger has retired from the head of the syndicate he represented. The reason given by him for this is that he has had too much work to do and was compelled to divide the responsibility with others. Altogether his enterprises are said to involve capital to the amount of nearly $15,000,000. Mr. Schlesinger was succeeded as president of some of his enterprises by John Scott, an Englishman who was managing director of the Cotton Oil Trust. M. A. Hanna, of Cleveland, succeeds Schlesinger as president of the Chapin, Buffalo, South Buffalo, Prince of Wales and Queen mining companies. The following gentlemen were elected directors of the Schlesinger companies: M. A. Hanna, Cleveland; Douglas Van Dyke, Ferdinand Schlesinger, John Scott and William Schlesinger, of Milwaukee. Douglas Van Dyke was chosen secretary and William Schlesinger treasurer of each company.

General S. V. Benet, Chief of Ordnance, U. S. A., was placed on the retired list on the 15th inst., after a service of 46 years in the army and 17 years as head of the Ordnance Department. He was a graduate of the Military Academy in the class of 1841, of which General Gilmore, Colonel Parke, General Dubarry, General Absalom Baird, General McKeever, General Saxton, and General Holabird were members. On graduation he was attached to the Ordnance Department, and stationed at various arsenals during the war. He was made a captain in 1861 and a major in 1863. He was commissioned a brigadier-general and chief of ordnance in 1874. In 1853 he published a translation from the French of Jomini of "The Campaign of of Waterloo." The University of Georgia, in 1855, conferred on him the degree of A. M. In 1862 he issued a "Treatise on Military Laws and the Practice of Court Martial."

## OBITUARY.

Baron Georges Eugene Haussman died in Paris, France, on the 11th inst. He was born in 1809. He was appointed Prefect of the Seine by Napoleon III. when the latter was President of the Republic. Haussman's works cost the municipality over 750,000,000 francs, and under his direction Paris was almost transformed into a new city.

Ludwig Rinman, director of the metallurgical office of the Swedish Iron Board, died at Nora, Sweden, recently, aged 75 years. Mr. Rinman held the position of director since 1856. He was author of a handbook upon furnace practice, and, in conjunction with B. Fernquist, of "Researches on the Chemical Composition, Pressure and Temperature of Blast Furnaces," besides many papers in *Jernkontorets Annaler*.

J. K. P. Miller, of Deadwood, S. D., died at Santa Barbara on the 11th inst. Mr. Miller was president of the Deadwood Central Railway and of the Deadwood & Delaware Smelting Company, and was largely interested in mining enterprises. It is said that to his individual efforts is due the construction of the Burlington & Missouri River Railroad and the Fremont, Elkhorn & Missouri Valley Railroads to Deadwood.

Capt. Joseph Brown Thomas died at his home in Boston, Mass., on the 14th inst. He was a pioneer to California, going thither in 1849 as commander of a bark loaded with mining tools. He was a member of the original vigilance committee, accumulated great wealth while in California, and returned to Boston 20 years ago. At time of his death he was a director in the Bank of California, and in the Sugar Trust and a large shareholder in the West End Railway Company.

Jesse Park Battershall, Ph. D., F. C. S., a chemist of marked prominence, died at Poughkeepsie, N. Y. on the 12th inst. He was born in Troy, N. Y., May 26, 1851. His chemical studies were begun in 1867 at the School of Mines, Columbia College, and continued in Germany. There, for a year he worked in the chemical laboratory at Göttingen, under Wöhler, and in 1870-71 under Kolbe at Leipsic. In 1873 the degree of Doctor of Philosophy was conferred on him by the University of Tübingen, following which he attended the chemical course of lectures by Marignac at Geneva. Upon the completion of his course of studies in Germany Dr. Battershall returned to New York, and was for a considerable period occupied as analytical and consulting chemist to various firms in New York City. He entered the government service in 1879, and for more than a decade had charge of the analytical department of the United States Laboratory at New York. Dr. Battershall was a Fellow of the London Chemical Society, and a member of the American Chemical Society and of other scientific bodies. He was the author of "Adulteration of Food and Drink," the translator of Naquet's "Legal Chemistry," and a voluminous contributor of papers to chemical journals.

## SOCIETIES.

The Ohio Institute of Mining Engineers will hold its eleventh annual meeting at Lyndon Hall, southeast corner of Fourth and Long streets, Columbus, O., beginning January 22d, 1891. The following programme has been arranged: Thursday, January 22d, 7 P. M.—"Annual Address of the President," Hon. Anthony Howells, Massillon, O.; "Report of Secretary and Treasurer," Hon. R. M. Hazeltine, Columbus, O; paper, "Municipal Corporations and Natural Gas Supplies," Prof Edward Orton, State Geologist, Columbus, O.; miscellaneous business. Friday, January 23d, 9 A. M.—Paper, "The Ores and Minerals of Virginia," exhibiting specimens. J. A. Ede, M. E., Jackson, O.; paper, "Blast Furnace Tar and Ammonia," Prof. N. W. Lord, O. S. U.; paper, "Management of Men in Mines," Wm. Hibos, M. E., Linton, Jefferson County, O.; paper, "Mine Explosions in England and Wales, and Number of Lives Lost," Capt. J. L. Morris, Coshocton, O. 1:30 P.M.—The afternoon will be devoted to the visiting of the different manufactories of mining machinery, including the Jeffrey Manufacturing Company, the Minot Electrical Company, the Lechner Electric Mining and Machine Company. 7:00 P.M.—Election of officers for the ensuing year; paper, "Difference between Mining Coal and Iron Ore," P. F. Schmidt, Post Boy, O.; paper, "Mine Ventilation as taught in the School of Mines, O. S. U.," Prof. F. W. Sneer; paper, "The Lower Coal Measures on the West Virginia side of the Ohio, Big Sandy and Twelve Pole Rivers," Hon. Andrew Roy, mining geologist, Glen Roy, O.

The American Society of Civil Engineers will hold its Thirty eighth Annual Meeting of the Society in New York on Wednesday, January 21st, at 10 o'clock. The annual reports will be presented, officers for the ensuing year elected, time and place for the next annual convention considered, reports of standing committees and of committee on revision of the constitution presented and discussed, and other business transacted. Lunch will be served at the Society House. Arrangements for the days and evenings of Wednesday and Thursday, January 21st and 22d, will be perfected by a committee.

The General Society of Mechanics and Tradesmen of the city of New York held its one hundred and fifth annual meeting on the 13th inst. at Mechanic's Hall, No. 18 East Sixteenth street. The secretary's report for the past year showed that the society had received $46,000, and had expended $43,750. The officers elected for the present year were Oliver Barratt, president; Joseph J. Little, vice-president; Guy Culgin, second vice-president; R. T. Davies, treasurer, and S. M. Wright, secretary. Mr. Andrew Carnegie was elected to membership in the organization.

The American Geographical Society held its annual meeting on the 13th inst. in Association Hall, Twenty-third street and Fourth avenue, New York. These officers were elected: Charles P. Daly, president; Gen. George W. Cullum, vice-president; Walter R. T. Jones, treasurer; Prof. William Libby, Jr., foreign corresponding secretary; W. H. H. Moore, the Rev. Dr. C. C. Tiffany, D. O. Mills, Orlando B. Potter, Henry Holt and Isaac Bernheimer, counsellers.

## INDUSTRIAL NOTES.

The Lackawanna Coal and Iron Company has purchased the Scranton Steel Works, at Scranton, Pa., and hereafter both plants will be operated under one management.

A bridge to cross Niagara River, N. Y., has been located, and will be constructed by the Canadian Pacific Railroad Company, directly below the mills at the north end of the falls.

The Austin Dam to be built across the Colorado River at Austin, Tex., by Bernard Corrigan, will be constructed in the main by the largest "Locke-Miller" cableway in existence. The main cable is 1,850 feet long, 2½ inches in diameter, of crucible steel. The whole plant was designed and furnished by the Lidgerwood Manufacturing Company, of New York City.

The Illinois Steel Company's dividend of 5% in stock is payable February 19th. Books close January 20th and open February 20th. It is understood that the company declared this dividend in stock as it wishes to use the cash to extend its structural iron plant, as the demand for increased sizes of beams requires additional facilities. The company, it is said, also proposes to erect a plate mill for the manufacture of steel plates.

The Allegheny Bessemer Steel Works at Duquesne are said to have closed down for repairs. The suspension will last several weeks. Gas will be put under nearly all the boilers in the works, and a new blooming mill will be completed.

It is rumored that the men des re a scale such as exists in the Edgar Thomson works and the Homestead mills. Should a demand be made for such it will probably be granted, as that is Mr. Carnegie's favorite wage system.

The Denver Steel Company has filed articles for the incorporation in Denver on the 8th inst. The object of the concern is to build and operate Bessemer works in Denver, Colo. The capital stock is $5,000,000. The following capitalists compose the board of directors: Ex-Governor John Evans, ex-Senator H. A. W. Tabor, David H. Moffat, C. B. Kountze, John J. Riethmann, J. Sidney Brown, R. W. Woodbury, J. K. Mullen, H. M. Porter, ex-Governor James B. Grant, Henry C. Brown, I. B. Porter and J. W. Nesmith.

All the machinery has been put in place at the extensive works of the Standard Fire Brick Company, at Anaconda, Mont., and the manufacture of brick has commenced. The plant is expected to turn out from 30,000 to 40,000 brick per day, and is furnished with water by the Anaconda Water Company. The buildings are covered with iron, and have excellent water facilities for the prevention of fire. H. A. Kent has been superintending the entire construction of the works. Homer Parinetier will be in charge of the manufacture of brick. The company has about 1,800 tons of silica and clay on hand. J. B. Losee is president; D. D. Walker, vice-president; Silven Hughes, secretary and S. A. Estes, treasurer.

The Board of Estimate and Apportionment of the city of New York has decided to ask Engineer Boller to amend the plans of the bridge over the Harlem River at Seventh avenue so as to bring the cost nearer to the appropriation limit of $1,200,000. Mr Boller has figured that a drawbridge sixty feet wide, with a span of 400 feet, would cost $1,183,000, and if the width were increased to eighty feet, as desired by the Mayor, the expense would be so large as to require further legislative action and a consequent delay. Controller Myers contends that the Federal Government should allow the erection of a permanent structure, and the Mayor, while coinciding with this view, expressed strong doubts whether the Government would agree to discontinue the work of deepening the Harlem River.

The Henning Rapid Transit Company has filed articles of incorporation. This company proposes to build a rapid transit between New York and Brooklyn, using a system invented by Benjamin S. Henning. The plan is to commence in Brooklyn, near Hamilton Avenue Ferry, and run thence, partly in cuts and partly underground, to the East River; thence under the East River by means of a tunnel, and under lands and streets in the City and County of New York to a point in the southwesterly corner of the Township of Westchester, with a branch line to the intersection of 155th street and Eighth avenue. The proposed road is fourteen miles long, and the five directors are Benjamin S. Henning, Richard Muse and O. H. Andrae, Jr., of New York; Grinnell Burt, of Warwick, and William E. Bond, of New Canaan, Conn.

The Wadhams Oil and Grease Company of Milwaukee, Wis., began business, eight years ago, in a small plant on Broadway. During that period its works have been enlarged until they now occupy the spacious building, situated at Nos. 116, 118 and 120 Fowler street. The company's western friends will be interested in

knowing that a Western branch has been opened at Seattle, Wash., where a stock of oils, greases and other lubricating specialties which it manufactures will be carried. The house will be in charge of Eugene C. Kirby, who is vice-president of the company, and the Western trade will have its wants well taken care of by him. This company's oil refinery is situated in the Pennsylvania oil district, where its cylinder and engine oils and stocks are manufactured, with general offices and factory at Milwaukee, where lubricants, greases and compression cups are manufactured.

Chief Engineer Worthen and General John Newton, consulting engineer, have submitted a report to the trustees of the ship canal, Chicago, Ill., recommending a definite route for the main portion of the great waterway, including the distance from Joliet nearly to the city limits of Chicago. The report has been adopted, and immediate proceedings for condemnation ordered. The cost of the waterway is estimated in the report at $25,700,000, the channel being 180 feet wide and 18 feet deep, with vertical sides of rubble masonry. The route selected is along the Ogden ditch line to the Desplaines Valley, crossing the river near Summit, and following the west side of the river to Joliet. A grade is provided of four-tenths of a foot a mile. If part of the channel is executed with a depth of 14 feet, the cost is estimated at $22,700,000. The construction of the immense undertaking, the report says, will consume four years.

A dispatch from Cleveland, O., says that 16 blast furnaces, all but two in the Mahoning Valley, have been shut down in pursuance of an arrangement, to which we referred in the last issue of the ENGINEERING AND MINING JOURNAL. Ten thousand men are thrown out of work. The object of the furnace men is to force the coke operators to reduce the price of coke and the railroads to reduce freight rates to and from the valley.

It is said, too, that a meeting of the principal iron interests in the East is likely to be called within the next week or so. The shut down in the West will tend to help trade, as it cuts off a considerable source of supply, but it will probably not be sufficient to induce the coke people to come to terms. United action throughout the State is spoken of and may possibly be resorted to. Southern furnacemen have been driven to the same extreme. It is stated that there are 15 furnaces banked in Birmingham, Alabama.

The M. C. Bullock Manufacturing Company, of Chicago, Ill., manufacturers of hoisting machinery, diamond drills for exploring purposes, general mining machinery and Corliss engines, write us as follows: "The year just past has been marked by unusual activity and we have been compelled to run our works to their fullest capacity, working double gangs of men for fully six months and time and a half for the balance of the year, excepting a few weeks during the heated season. We have constantly been increasing our facilities by adding lathes, planers, slotters, cranes, boring machines, etc. We have built a new smith shop 100 × 55 feet, also a new pipe shop and a large extension to our erecting room. We have had an unprecedented demand for our Corliss engines, both simple and compound, and also for our band friction hoisting machinery, many of the plants having drums ranging from 12 to 20 feet in diameter. Among them are several first motion hoists with reels for flat ropes, driven by a pair of our Bullock Tandem Compound Corliss engines, one of these going to the famous Huanchaca silver mine, located at an altitude of 15,400 feet above sea level in the Bolivian Andes. We have also had a large and growing demand for our diamond-pointed rock drills, both for domestic and foreign trade. In fact, at this time we are shipping drills to Colorado, Lake Superior, Canada, Mexico and to the gold fields of South Africa.

"We beg to thank the ENGINEERING AND MINING JOURNAL for some very satisfactory orders which have come through our advertisement in your columns."

### MICHIGAN INDUSTRIAL NOTES.

(From Our Special Correspondent.)

A fatal explosion of gas occurred at the iron, smelting furnace of the Newberry Furnace Company at Newberry, on Thursday of last week. An employé named John La Bombard was literally cooked to death in the molten metal and five others injured. The explosion was caused by the escape of gas from the bell into the brick tophouse which had been built over it. The tophouse was wrecked and its débris falling upon the casting house crushed it in and pinned La Bombard to the ground. The damage to the furnace will not exceed $5,000. The work of relining the stack will be commenced in about two months.

## MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

**If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.**

**Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from his office. No charge will be made for these services.**

**We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.**

**These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.**

### GOODS WANTED AT HOME.

**2,011.** Machinery for a canning factory. Alabama.
**2,012.** A 50 to 60 horse power boiler and engine. Virginia.
**2,013.** Elevator. Virginia.
**2,014.** Hoisting and drying fan. Virginia.
**2,015.** Shafting, pulleys, hangers and couplings. Virginia.
**2,016.** Boring machines. Virginia.
**2,017.** Sanding machines. Virginia.
**2,018.** Power hammer. Virginia.
**2,019.** Dry kiln. Virginia.
**2,020.** A small marine boiler for a steam launch—water tube boiler preferred. Virginia.
**2,021.** Small saw mandrels, suitable for 20-inch saws. Virginia.
**2,022.** Iron top table suitable for table saws. Virginia.
**2,023.** Second-hand engine, about 6 × 8. Virginia.
**2,024.** An edger. Virginia.
**2,025.** A machine for sawing box slots, ¼ inch thick, 28 inches long and 5 inches wide. Virginia.
**2,026.** Machinery for hoisting coal; 40 or 50 horse power engine and boiler, drum, wire rope, etc. Alabama.
**2,027.** Electric light plant. Ohio.
**2,028.** Boiler and engine. Ohio.
**2,029.** A high 10-inch guide train complete. Pennsylvania.
**2,030.** A set of three-high 14 or 16-inch breakdown rolls with pinions and housings complete. Pennsylvania.
**2,031.** A 20 × 48 horizontal engine. Pennsylvania.
**2,032.** A 12-foot diameter band fly-wheel 32-inch face, 8-inch bore, weighing about eight tons. Pennsylvania.
**2,033.** A six-foot diameter band wheel 32-inch face, 8-inch bore. Pennsylvania.
**2,034.** A 10-foot diameter 5-ton fly-wheel, 8-inch bore. Pennsylvania.
**2,035.** Brick machinery. Maryland.
**2,036.** Planing mill machinery. Maryland.

### AMERICAN GOODS WANTED ABROAD.

**2,001.** Estimates on a small canning outfit. Canada.
**2,007.** Prices and particulars of mining machinery. Australia.

## GENERAL MINING NEWS.

At the Spanish mine, Nevada county, Cal., it is said a living profit has been made out of gold quartz yielding only $1 a ton. The average cost of working was there found to be 57½ cents a ton, 23 cents of which was for milling. At the Delmatia mine, near Auburn, Eldorado county, Cal., a large body of salt ore, which is said to carry from $1.50 to $2 a ton in gold, was profitably worked. Superintendent Pearson reports that 42½ cents covers the whole cost of mining and milling.

With these figures as an example, it is urged that the quartz lode on the east fork of the Carson which is said to assay from $4 to $12, might be profitably worked. Both water and timber can be had cheaply in the immediate vicinity.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—We are officially advised that the Tracy City Division of this company mined in 1890, 350,000 tons coal. The shipments for the same period foot up as follows:

| | Tons. |
|---|---|
| Coal | 180,064 |
| Coke | 116 605 |
| For the year | 296,669 |

The demand for coke being very limited in the fore part of the year only 234 coke ovens have been in operation out of 534. The company has disposed of 30,000 tons of stock coke on hand in the yards and converted this into money. The demand for coal is now very good and supply of transportation ample.

### ALABAMA.

The striking miners at the Blocton coal mines held a meeting on the 13th inst., and decided to return to work at the same pay as heretofore. Over a thousand men were out at this mine, and their action will probably break up the strike which has involved nearly 8,000 miners in the district. The strike has been in progress since December 1, and was caused by the refusal of the mine owners to grant an increase of five cents per ton and their refusal to recognize the Order of United Mine Workers.

### ARIZONA.

#### YAVAPAI COUNTY.

Several fine samples of the onyx from the mines at Big Bug were recently sent to Austin, Texas, and their beauty and fineness of texture excited such general comment that a proposition to use the Arizona stone in finishing the new State capitol has met with general approval. As there is a 50% ad valorem duty on all onyx imported from Mexico into the United States, there is no doubt but that the Arizona stone will take a prominent place in the American market.

### CALIFORNIA.

#### MONO COUNTY.

STANDARD CONSOLIDATED MINING COMPANY.—In the mine the new "Virgen" ledge is showing high grade ore, and there is improvement at other points on the 400 level.

#### NEVADA COUNTY.

The San Francisco *Alta*, in a review of the year, says: "In Nevada county gravel miners have been at a disadvantage. No opportunity has been lost by the anti-miners to do everything that lay within their power to harass and annoy all engaged in drift mining. The North Bloomfield Company, which in former days sent out hundreds of thousands of dollars annually, and has immense riches stored away in its gravel banks, is at present occupying the position of defendant in five distinct suits. The result of this continuous conflict is seen in the reduced bullion output of the State, for although the total sum for 1890 can only be approximately arrived at, yet it is certain that it will be less than in 1889. The United States Debris Commission, created under the Biggs Act, will file its report at the end of this month."

GOLD HILL MINING COMPANY.—This company has just completed a clean-up of 141 tons of ore that was worked at the Crown Point mill, and proved to be richer than was expected. The mine will be idle now until the steel pipe for conveying water arrives and connection is made with the South Yuba's water system. By that time the company will have its mill built and ready for work.

#### SAN BERNARDINO COUNTY.

SAN JACINTO ESTATE, LIMITED.—It is reported that a considerable amount of capital has already been invested in developing the tin mines near Riverside. The property has been well equipped with machinery, large buildings have been erected, roads made and the mines are being well developed. It is also said that some good bodies of tin ore have been opened up.

VALLEY GOLD COMPANY.—The following clipping relative to a Californian mining deal is taken from an English exchange: "Mr. Justice Romer recently gave judgment in the case of Angus vs. Clifford. The action was brought by Mr. John Angus, of Liverpool, for damages against Sir Charles Clifford and three other directors of the Valley Gold Company (Limited), on the ground that he had been induced to take 2,000 shares of £1 each in the company in consequence of certain misrepresentations contained in the prospectus. It appeared that the Valley Gold Company was incorporated in August, 1886, for the purpose of purchasing some gold-bearing land in California from an American company. The prospectus was issued in October, and was shown to and approved by the directors. In June last the company went into voluntary liquidation with a view to reconstruction. The misrepresentation on which the plaintiff relied was this: "Full reports of the property have been prepared for the directors by certain eminent engineers, who have personally inspected the property, and have advised the board as to the means to be adopted in working and developing the property to the best advantage. These reports had convinced the directors that the estate was a rich one, and they had no hesitation in recommending the shares to the public as a genuine investment." The meaning of these words, the plaintiff contended, was that the directors had employed these gentlemen to make reports to them for the purpose of satisfying themselves as to the character and prospectus of the enterprise, and he accordingly took the shares on that understanding. It afterwards turned out, however, that the engineers had acted under the instructions of the agent of the vendors in London, and that the report was made before any of the defendants were asked to become directors of the company. The construction put upon the words by the defendants was that the reports were prepared for the vendors for the purpose of showing them to those gentlemen who were willing to become directors, and that, in fact, there was no misrepresentation. His Lordship gave judgment for the plaintiff with costs, and directed an inquiry as to the amount of damages. Sir Horace Davey, Q. C., and Mr. Hughes appeared for the plaintiff, and Mr. Rigby, Q. C., and Mr. Asquith, Q. C., for the defendants.

#### WASHOE COUNTY.

WASHOE QUICKSILVER MINING COMPANY.—This company has perfected its title by the payment of the incumbrances upon the property, and it is said that everything is now all right in connection with its affairs. The property is situated about a mile from Steamboat Springs, in this county.

(From our Special Correspondent.)

CONTRA COSTA COUNTY.

SAN FRANCISCO, Jan. 8.

The anxiety for a cheap coal supply has stimulated the working of coal beds in different parts of the State. In Mendocino, Monterey and San Bernardino counties, as well as at the Black Diamond mine, referred to following, work is being prosecuted vigorously, and a ready market found for what is after all an inferior product.

BLACK DIAMOND.—It is reported that the Southern Pacific Railway is negotiating for the purchase of this property. The mine has been in litigation for a long time, and consequently the owners did not feel warranted in making improvements and abandoned it. A decision having confirmed the title to the present owners, the mine is again to be worked.

SANTA BARBARA COUNTY.

OCCIDENTAL MINING COMPANY.—The oil from the wells is averaging about 30 barrels each day, and is worth about $2 per barrel delivered at Los Angeles. Last Monday the oil was turned into the pipe, which has been laid from the wells to Carpenteria, a distance of three and a quarter miles. The line is down grade, and the oil flows by gravity. It took just one hour to reach Carpenteria. An iron tank has been erected at the wharf, having a capacity of 280 barrels, and is now being filled; shipment in bulk by means of tank cars will commence probably this week.

SUMMERLAND.—There are ten productive wells in this group, and the gas is now as great in volume and as steady as when first struck. A week ago another flow of gas was struck. The difficulty at present seems to be how to utilize the gas to advantage.

## COLORADO.

The articles of incorporation of the Denver Miners' Home and Land Company was filed recently. The capital stock of the company is $60,000, and the incorporators are: M. D. Van Horn, S. H. Elbert, Frank Church, C. M. Clinton and O. E. Harris. The company has for its object the erection and maintenance of a home for disabled miners, smelters and quarrymen of the State.

CLEAR CREEK COUNTY.

ATLANTIC & PACIFIC RAILWAY TUNNEL COMPANY.—This company has issued bonds which have been placed on the New York market for the purpose of securing additional funds with which to prosecute work upon its tunnel and mining enterprise at Georgetown.

DENVER COAL COMPANY, LIMITED.—It is reported that a syndicate, composed of English capitalists, has purchased about 640 acres of coal land about four miles north of Golden. The price paid for the land was $100,000. The above company has been incorporated with a capital stock of £100,000.

LAMARTINE.—A remarkable piece of ore was blasted from the foot wall in this mine recently. The dimensions of the piece were 7×11×4 feet. Its weight was about 20 tons, and its value not less than $4,000. The block was composed entirely of solid mineral.

CHAFFEE COUNTY.

MARY MURPHY MINING CO.—This company is erecting large dressing works for the treatment of its low grade ore. They are to cost about $50,000. Huntington pulverizers and belt machines are to be used in the mill. From 50 to 125 men are employed in the mine in breaking ore and prospecting, and as soon as the mill is completed a vigorous campaign will ensue.

GILPIN COUNTY.

BATES-HUNTER MINING COMPANY.—The superintendent reports under date of January 8th that the main shaft has been sunk 12½ feet, finishing a hundred-foot contract and making the shaft 745 feet in depth. The 8th level west has been started. It shows a strong crevice, with about 2½ feet of pay ore, widening toward the west. The 7th level has been driven west 43 feet with a good vein all the way. Great results are expected from this block of ground, 175 feet in height between the 6th and 8th levels.

The output for December was as follows:

| | |
|---|---|
| 51½ cords of mill ore | $1,253.79 |
| 46¾ tons of tailings | 278 35 |
| 41 tons of smelting ore | 1,351.56 |
| Total | $2,886.70 |

GILPIN TRAMWAY COMPANY.—The business of this company in 1890 was as follows: Total number of tons of ore transported over the line, 69,655½, of which 13,510 tons was smelting ore and 56,145½ tons milling ore. The company has three locomotives and 100 available ore cars.

NEW CALIFORNIA MINING COMPANY, LIMITED.—The production of this mine, which is the deepest in Colorado, in 1890 was as follows:

| | Tons. | Value. |
|---|---|---|
| Milling ore | 10,565 | $78,050 |
| Smelting ore | 15,265 | 14,648 |
| Concentrates | 1,412 | 21,955 |
| Total production for year | | $114,653 |

The depth of the main shaft is nearly 2,100 feet; sinking going on at the present and it will be continued to a depth of 2,200 feet. The principal part of the ore mined, milling and smelting, came from below the 1,800-foot level. The stamp mill ore was treated at the company's 75-stamp, Hidden Treasure mill at Black Hawk. All the ore mined is conveyed from the mine to the mill by means of the Gilpin County tramway. The average number of stamps dropping on ore during the year was 30, the remaining portion of the mill finding employment on custom ore.

HINSDALE COUNTY.

ULAY.—The mining force in this property is being increased and development is rapidly progressing in all the levels. As soon as the electric light plant is in operation it is reported that the underground force will be further increased. From ordinary development work, from 10 to 20 tons of concentrates and sorted ore is being shipped every day, and there is probability that this production will soon be largely increased.

LAKE COUNTY.

ALLEGHENY MINING COMPANY.—This company has granted a lease to Messrs. Dunn & Boylan, of a portion of the ground of the Shenango, adjoining the property of the Mikado. The Shenango shaft will be used for the purpose of opening up this tract, which is thought to contain some portion of the Mikado ore chute, and a powerful plant of machinery is now being erected at that point. The principal work will be done from the station at the 350-foot level, though the shaft is about 100 feet deeper, so that if an ore chute is encountered, it will be easy to command it. The workings are free from water at the present time.

CONTINENTAL CHIEF.—This mine is reported to be looking better than ever, the ore chute improving as depth is gained. Owing to the difficulty of renewing the ore contract with the smelters on January 1st, the management has decided to stack the ore at the mine for the present. The same number of men will be kept on the pay-roll and work will proceed as usual, as there is room to stack 5,000 tons of ore if necessary. The breast at present shows over 20 feet of good ore, with mineral on top, bottom and sides.

LUZERNE.—Work is progressing rapidly in this property on the northeast side of the shaft, where a drift has been run to intercept the streak of ore upon which the first work was done. The contact is looking well mineralized, and detached bunches of lead carbonate are coming in from time to time. The original theory, that the shaft had struck the apex of a lime roll, appears to be confirmed by the further developments, and should the ore, when again met with, be found to be dipping much, the chances are that the shaft will be continued downward, and a drift run at a much lower level. The argentiferous iron enclosing the lead ore has slightly improved in its silver contents, and the entire prospect is said to be very encouraging.

OURAY COUNTY.

YANKEE BOY MINING COMPANY.—This company held its annual meeting in Portland, Me., on the 13th inst. The following board of officers was re-elected: John Gerber, New York, president; Adolph Kuttroff, vice-president; Robt. Roethlisberger, treasurer. The officers, together with Frederick V. Chase, Frank M. Clute, constitute the board of directors. Dr. F. M. Enlich is the superintendent. The annual reports of the officers showed the company to be in a flourishing condition. More will be said concerning the property at a later date.

PARK COUNTY.

EMMONS MINING COMPANY.—This company has leased the Peerless Maud mine for five years from December 8th, 1890. It has already commenced to put this property in condition for stoping the large amount of ore that has been left above the 100-foot level by the previous lessees. They have had no facilities for concentrating, only stoped out the high grade shipping ore that appeared as the work progressed. Arrangements are now being made to erect a wire tramway and concentrating mill in the early spring. No attempt will be made to ship any ore, except what comes out in development work, until these are completed.

PITKIN COUNTY.

DEEP SHAFT MINING COMPANY.—The water in the shaft has been lowered to the 600-foot level. The rest of the shaft cannot be cleared until additional steam power shall have been secured. New boilers are to be put in and this improvement cannot be completed for some time. In the meanwhile a drift already driven 50 feet is being run to connect with the Enterprise. It will strike the contact about 150 feet below the bottom of the Enterprise incline, and it is expected that it will develop the Little Nell ore chute at that point. Under the consolidation recently effected between the Deep shaft and the Enterprise the latter property will be worked through the shaft. The Enterprise has not produced any ore since the great flood closed it down last May, but resumption of production may now be looked for at an early date.

EDISON NO. 2.—The developments on the middle section of the Edison, known as the Edison No. 2, have been going forward steadily since the ore body was struck there, and the showing made is now most satisfactory. It is expected that a large production will be made during January and succeeding months. It is stated that since the discovery of the ore body, mineral to the estimated value of $70,000 has been blocked out. The shipments that have so far been made have been of two classes. The last lot of first-class ore went 84 ounces per ton, and the last lot of second-class 41 ounces. These returns are rather above the average of that section, and they indicate that the property will be profitable.

FRANKLIN MINING COMPANY.—The work of pumping out this mine is progressing, but there is an enormous body of water to be raised, as all the submerged levels of adjoining properties have to be drained. The mine is now about half unwatered, the water having been lowered to the fifth level.

LAST DOLLAR.—The main working incline of this mine has been sunk to the fifth level below the old level connecting with the bottom of the Justice shaft, and it has shown ore nearly all the way down. At places the contact has been lean, but there is a very good showing in the bottom, and it looks as though the ore chute might be as large there as it is above. This incline can be driven nearly a 1,000 feet in Last Dollar ground.

The ore body that was opened through the old shaft has proved to be of enormous size. Since the shaft was sunk deeper and the new plan of development carried out, this ore body has been opened to a height of nearly 70 feet. The grade of the shipping ore is very good, and there are immense quantities of ore that will not now pay, but that will eventually become marketable. The mine is said to have a capacity of 300 tons of ore per day that will run from 12 to 20 ounces. The ore now produced carries from 50 to 80 ounces silver, and much of it is heavy in lead.

LITTLE RULE MINING COMPANY.—In all workings of the mine the vein continues well defined; the pay streak of ore is from two to four feet in width, and the ore body is improving as the work is pushed south. The low grade ore in these workings is left in the mine, awaiting a better market; as it can be handled at a good profit with proper reduction works in Aspen, it is deemed best by the management to hold this ore until such works are completed.

SUMMIT COUNTY.

IRRIGATION, MINING AND REDUCTION COMPANY.—Articles of incorporation of this company have been filed by Henry W. Comstock, Irving Howbert, Jas. P. Maxwell, Frank W. and Edgar Howbert, of Colorado Springs. The company has valuable claims in this county which it has been successfully operating for some time.

## GEORGIA.

CATOOSA COUNTY.

(From our Special Correspondent.)

There has been considerable prospecting done in this county for some time in search of coal, and it is reported that a small vein has been struck.

DUNCAN.—Mr. Carthright is negotiating with capitalists for the purchase and development of his silver mines, three miles southwest of Ringgold. He has been offered $10,000 for a half interest in the Duncan silver mine, and has the offer under consideration.

## IDAHO.

ALTURAS COUNTY.

The following statement of ore shipped from Hailey during 1890 is obtained from the books of the railway company:

| Name of mine. | Pounds. | Name of mine. | Pounds. |
|---|---|---|---|
| Idahoan | 1,120,000 | Camas No. 2, concentrates | 1,099,000 |
| Red Elephant | 942,000 | Odd lots of lease ore | 1,175,000 |
| Red Cloud | 1,493,000 | | |
| War Dance | 549,500 | | |
| Jay Gould | 319,500 | | |
| King of the West | 295,500 | Total for 1890 | 7,511,000 |
| Carrie Leonard | 153,000 | Total for 1889 | 5,698,625 |
| Nettie | 184,000 | | |
| Nay Aug | 130,000 | Increase | 3,812,375 |
| Crœsus | 49,000 | | |

SHOSHONE COUNTY.

It is said that the developments on the Paragon claim near Murray are very encouraging. A tunnel run into the ground about 40 feet shows a well defined vein, two feet of which are said to be galena and four feet concentrating ore. Both foot and hanging walls are of slate, and at right angles to the general lay of the country. The strength of the vein gives promise of its continuity. The Barton, now being worked under bond of Colonel Haskell, is also said to be looking well.

GALENA AND UNION.—It is reported that the new concentrator for these mines will be located just west of the Argentine, between the two railroads. It will be of 250 tons capacity. Work on the flume is now under way, starting at the mouth of Lake Gulch. The water will have about 50 feet fall at the mill. Both of those mines are in splendid condition. In the Union there is a body of 14 feet of good ore. The Galena has already earned a handsome sum in excess of the purchase price. There has been hardly any dead work, and the mine has produced steadily since the first discovery.

MORNING.—The sale of this mine by Peter Porter, receiver for the Charles Hussey property in Idaho, is reported. An English syndicate is said to have paid $900,000 for the property.

## KANSAS.

### CHEROKEE COUNTY.

A special report shows that during the wee ending January 10th, the output of ore from the mining districts of Galena and Empire City was: Rough ore, rounds milled, 1,880,290; zinc ore, pounds sold, 450,000; lead ore, pounds sold, 102,140. Sales aggregated a total value of $7,672.

### LEAVENWORTH COUNTY.

News reaches us that 400 men employed by the Leavenworth Coal Mining Company, and 20 employed by the Home Company, are on strike against a reduction in wages from four and a half to four cents a bushel. The mines are idle.

## MICHIGAN.

### COPPER.

The total amount of refined copper shipped from Portage Lake during the 1890 season of navigation, given as 74,760,030 pounds, is divided as follows:

Allouez, 1,086,209 pounds; Arcadian, 11,978 pounds; Calumet & Hecla, 43,321,768 pounds; Kearsarge, 1,075,459 pounds; Tamarack, 3,580,178 pounds; Osceola, 3,642,393 pounds; Quincy, 5,844,549 pounds; Franklin, 4,851,729 pounds; Atlantic, 2,829,884 pounds; Huron, 1,200,000 pounds; Peninsula, 600,238 pounds; manufactured copper, 2,926,384 pounds; Central, 1,068,170 pounds; Copper Falls, 1,086,209 pounds; National, 77,475 pounds; Knowlton, 13,789 pounds; Evergreen Bluff, 15,309 pounds; Adventure, 13,485 pounds; Hilton, 12,680 pounds.

(From our Special Correspondent.)

HOUGHTON, January 13.

ARNOLD MINING COMPANY.—The adit in this company's mine is now in 70 feet and has pierced the belt of sandstone and conglomerate. Its course will now lie along a fissure vein but Capt. Moyle expects nothing from this vein until he is in at least 100 eet.

COPPER FALLS MINING COMPANY.—The December production of the Copper Falls mine was 86 tons 400 pounds. The stamp mill is working to its full capacity on rock coming from the new openings east of the Owl Creek vein. The management has decided not to haul its winter product to the nearest railroad shipping point at Allouez, but will allow it as heretofore to accumulate at Eagle Harbor until navigation opens.

QUINCY MINING COMPANY.—During the year 1890 the Quincy was made practically a new mine. The starting of the double skip roadway in No. 2 shaft on Wednesday night of last week marked the completion of the work which has doubled the producing power of the Quincy without interfering with its regular operation. The work of enlarging No. 2 shaft was commenced on the surface last September and one year was believed necessary to effect its completion to the 40th level, a distance exceeding 3,000 feet. Not only was the shaft doubled in size, but the second roadway was built and equipped, all of this work going on, without delaying for an hour the hoisting in the old compartment, during the space of five months. All of the shafts are now provided with double skip roads, and the skips adjusted to the drum on the counterbalance system. The drums have been increased 13 inches in diameter, and a tooth gear with pinions one foot greater in diameter will be substituted throughout for the friction gear. The skips have been enlarged to 67 cubic feet capacity, or about three tons of rock. Next spring the old incline tramway, over which the rock was sent to the old stamp mills at Hancock, will be sent to the dock on Portage Lake and used for the transportation of all the mine freight from the vessels.

### IRON.

### MARQUETTE RANGE.

MARQUETTE, Jan. 13.

DETROIT MINING COMPANY.—B shaft is 60 feet below the 100 foot level. This week a crosscut from the bottom to the southward will be commenced. In drifting through the new ground at the 350-foot level a good deal of high-grade hematite was encountered in irregular formation. The owners of the mine had about determined last autumn to close it indefinitely, but at the suggestion of Captain Thomas, B shaft was sunk to develop the extent of the deposit above mentioned.

SCHLESINGER.—The management of this group of mines, located at Negaunee, has had some difficulty in meeting its November labor bills. The employés have been looking for their money from time to time, basing their expectations upon assurances of early settlement. Last Monday noon, no money being forthcoming, 150 underground men refused to return to work until they were paid or the money was in sight. Arrangements were finally effected whereby local capitalists guaranteed payment on Wednesday, and the strikers resumed work on Tuesday night. The mines affected were the Queen, Prince of Wales, Buffalo and South Buffalo. The financial embarrassments of the syndicate have finally beeno vercome, and the miners will, in future, be regularly paid.

### GOLD.

MICHIGAN GOLD COMPANY.—A meeting of the stockholders was held in Marquette last week. It was decided to hold the annual meetings hereafter on the 4th of February of each year and to remove the general offices from Cleveland to Marquette.

ROPES GOLD AND SILVER MINING COMPANY.—The lead of quartz in the northeast drift of the twelfth level came to an abrupt end on Friday of last week, although gradually widening from six to twelve inches in eighteen feet. Unwilling to believe that the lead could terminate so abruptly in that direction, the mining captain ordered another hole put in. The blast revealed an immense pocket of auriferous quartz. No assay has yet been made, but competent judges estimate the metallic contents at not less than $250 per ton.

## MISSOURI.

### JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, Jan. 12.

The new year has opened with lower prices in the zinc ore market, the average price for zinc ore having fallen to $23.50 per ton; the price of lead, however, has advanced to $25 per thousand. Following is given the sales from the different districts as far as reported:

Joplin mines, 1,095,420 pounds zinc ore and 144,980 lead; value, $16,479.50.

Webb City mines, 404,570 pounds zinc ore and 66,205 lead; value, $6,400.

Carterville mines, 1,158,260 pounds zinc ore and 54,340 lead; value, $14,965.

Zincite mines, 201,620 pounds zinc ore and 230 lead; value, $2,371.75

Lehigh mines, 43,530 pounds zinc ore; value, $565.50.

Oronogo mines, 41,909 pounds zinc ore and 8,950 lead; value $718.

Galena Kans, Mines 450, pounds zinc ore and 102,140 lead; value, $7,672.

All districts total value $49,171.75.

The Cresswell Mining Company have received an eight inch drill and will at once commence prospecting their property. Two holes will be sunk to a depth of not less than 200 feet.

The Ruby Lead and Zinc Company have just erected a good plant of machinery. With the increased capacity of the concentrating mill more water was required than the mine could supply, so an artesian well was sunk to a depth of 420 feet, at which point a sufficient flow of water was obtained.

From the Astor mines there were sold 116,820 pounds zinc ore, and about 12,000 pounds held over in the bins. Collins & Paterson have purchased the Metska mine of the Toucher land, and are preparing to set up a plant of machinery.

The Bay State mines on the Oswego land produced 59,760 pounds zinc ore and 1,300 pounds lead.

The Oswego Mining Company turned in from all of its mines 130,000 pounds zinc ore and 45,000 pounds lead. The Sterling Lead and Zinc Company keeps up a steady output; last week its Manhattan mine produced 31,000 pounds zinc ore, and the Little Nugget mine 24,260 pounds zinc ore. Snyder Bros. shipped 22,870 pounds zinc ore from the Choctaw mine. Some very fine lead and zinc have been recently opened at a point called Purdy, about ten miles from Pierce City, and reports indicate that there will be a good mining camp there.

## MONTANA.

### DAWSON COUNTY.

In a well near Chinook in the Milk River Valley gas is recently reported to have been found. The well, started for the purpose of getting water, has now a depth of 1,100 feet. Water rises in the borehole to within 50 feet of the surface and upon this is a layer of petroleum 10 feet thick. Gas escapes from the hole in such quantities as to make the burning of lights in the head-house impossible owing to the danger of explosions and fires.

### DEER LODGE COUNTY.

RUBY CONSOLIDATED MINING COMPANY.—It is reported that the American Ruby Mining Company in Oro Fino District has been reorganized for the purpose of making the stock assessable, and is now styled as above. The directorate of the new company consists of J. S. Halteman, of Helena; Frederic DeHass, Christian Fry, F. R. Welz, F. E. Snow and Nico Van der Velde, of St. Paul; C. Doremus, of New York; H. L. Hoyer, of Champion, and William J. Rathjen, of Milwaukee. From the board of directors the following officers were elected: J. S. Halteman, president; Frederic DeHass, vice-president; Christian Fry, secretary; F. R. Welz, treasurer. The present development consists of a 350-foot shaft from which levels have been run on the 2,500 exposing a body of milling ore. A crosscut is now in progress from the 350 which will tap the vein in a few days, when it is believed the mine will develop a shipping proposition. The property is equipped with a first-class steam hoist, an Ingersoll steam drill and other accessories essential to rapid and economical development. For the present and until the mine is thoroughly proven on the 350, operations will be carried on on that level exclusively.

### LEWIS AND CLARKE COUNTY.

HELENA AND LIVINGSTON SMELTING COMPANY.—The smelter at East Helena is now running full blast, the fourth and last furnace in the works having been blown in last week. There are about five hundred men steadily employed at the works, and six roasters and four furnaces are kept hot night and day. It is reported that there is no lack of ore—in fact the supply is only limited by the ability of the railroads to handle it. At times it has been almost impossible to secure cars fast enough to supply the demand for them.

### MEAGHER COUNTY.

QUEEN OF THE HILLS' MINING COMPANY.—Developments are in progress which will soon put this mine in shape to produce about twenty-five tons of ore daily. The ore is high grade, averaging fully $100, and its shipment will return revenue sufficient to carry on the extensive system of development which the company is about to undertake. There is already an accumulation of this ore at the dump and shipments will be commenced in a few days.

### MISSOULA COUNTY.

COPPER BELL.—It is said that preparations are making to sink the shaft from the 250 level to the 500. A new boiler and a station pump have been recently added to the mine's equipment and work on the extension will begin shortly. Enough work is being done by a force of 20 men on the 250 level to pay running expenses. Shipments during the past six months have yielded something over $30,000.

ELDORADO MINING CO.—The long standing dispute between the claimants of the William Tell and Blue Dick quartz lodes in Spring gulch is said to be adjusted and the two claims have been incorporated under one ownership to be known hereafter as the Eldorado Mining Company. The incorporators are: E. M. Tower, Henry Bernard, Thomas J. Lapp, August Herzog and Lyman C. Mosier, who are also named as directors for the first three months. At the meeting held last night M. E. Rutherford was elected treasurer. The Eldorado mines adjoin the O. R. & N. mine on the west and the Iron King and Queen on the east. On both of the latter claims shafts have been sunk to a depth of 300 feet. Through these shafts large bodies of galena and gray copper have been exposed. It is therefore believed that the ore chutes of the O. R. & N. and Iron King mines cross the full length of the Blue Dick and William Tell claims. The apex of the ledge is clearly defined on the surface of the Eldorado ground. For the purpose of sinking a shaft to the depth of 300 feet the company has decided to offer for sale 20,000 shares of treasury stock at 10 cents per share. There are 500,000 of a par value of $5. The dispute heretofore existing between the rival claimants has prevented much development, but the location is such that it is hoped but little work will be necessary to place the mine on a paying basis.

### SILVER BOW COUNTY.

BUTTE & BOSTON MINING COMPANY.—The following appeared in the Boston *Post* in answer to some inquiries with reference to the probable appearance of an annual report: The Butte & Boston's fiscal year ends June 30, but it is not likely that an annual report will issue yet awhile. The company is in the development stage as yet, and the management does not see the need of making a report until there is more upon which to report. The company will start up its new plant between now and the first of February. This plant consists of two blast furnaces, one of two hundred and the other one hundred tons daily capacity; four reverberatory furnaces of twenty tons capacity per day; six large Brückner and six O'Hara furnaces for roasting ore, and three dryers of five hundred tons and more capacity per day, the latter for saving fuel and drying ore in its process of treatment. It will take a month to get matters running smoothly, but by March 1 this complete and entirely new plant ought to be in full operation. It is expected that March will show from 1,500,000 to 2,000,000 pounds of fine copper, and the cost will be less than to the Boston & Montana, as the latter took an old plant and improved thereupon as opportunity offered, while the Butte & Boston's plant is new in every way, with every improvement. The net profit is figured at from $50,000 to $60,000 per month when everything is running well. It was expected to have this plant running last October, but many delays occurred, including non-delivery of machinery, etc. The company's prospects are promising, although we should hardly begin to talk about dividends until the last decade of the nineteenth century gets a little farther along, say in another year and a half or so.

BOSTON AND MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The figures of product for the first half of the current fiscal year are said to be as follows:

| | Copper, pounds. | Silver, ounces. |
|---|---|---|
| July | 2,150,000 | 22,300 |
| August | 2,400,000 | 23,296 |
| September | 2,300,000 | 22,530 |
| October | 2,500,000 | 23,370 |
| November | 2,150,000 | 21,918 |
| December | 2,150,000 | 22,000 |
| Total | 13,650,000 | 135,414 |

Comparisons.

| December— | 1890. | 1889. | Decrease. |
|---|---|---|---|
| Copper, pounds | 2,150,000 | 2,200,000 | 50,000 |
| Six months— | | | |
| Copper, pounds | 13,650,000 | 13,122,789 | *527,211 |
| Silver, ounces | 135,414 | 138,919 | 3,505 |

*Increase.

Under the operation of the Boston & Montana sinking fund, a certain amount of bonds are retired in January and July of each year. We are indebted to the Boston *Evening Transcript* for the following statement of this account:

| | | |
|---|---|---|
| First mortgage 7 per cent. bonds, first issue dated Aug. 1, 1887 | | $1,000,000 |
| Reduced by sinking fund to date by.. | $198,000 | |
| Plus reduction of present month..... | *46,000 | |
| | | 244,000 |
| Outstanding and subject to interest first half 1891 | | $756,000 |
| First mortgage 7 per cent bonds, second issue, dated Feb. 1, 1890 | | $500,000 |
| Reduced by sinking fund to date by.. | $19,000 | |
| Plus reduction of March, 1891..... | †26,000 | |
| | | 45,000 |
| Outstanding and subject to interest first half of 1891 | | $455,000 |

* Estimated, $50,000 applicable, but bonds may command a premium, current price being about 105. † Estimated.

The fixed charges of the Boston & Montana will be for the first half of 1891, approximately:

| | Per annum. |
|---|---|
| Seven per cent. on $802,000 bonds | $56,140 |
| Seven per cent on $481,000 | 33,670 |
| Sinking fund, first issue | 100,000 |
| Sinking fund, second issue | 50,000 |
| Total, per year | $239,810 |
| Dividends, $1.50 per share per quarter, or $6 per annum on 125,000 shares | 750,000 |
| Total to be earned, net per annum | $989,810 |

EMILY.—A seven-foot body of good silver ore is reported to have been struck in the Emily claim, which lies just east of the Moose. The ore was first encountered at a depth of ninety feet, and the shaft has now been sunk an additional forty feet with ore from the ninety-foot level, the vein being almost perpendicular. About 200 tons have been extracted so far and sent to the Pueblo smelting works, and more is being hoisted every day. The property is under lease and bond to P. T. Cunningham, formerly superintendent of the Jersey Blue.

SNOW DRIFT AND SILVER LAKE MINING COMPANY.—The first meeting of this company was held recently in Butte. Hon. Martin Maginnis was elected president; Michael Carroll, vice president; F. E. Corbett, secretary; M. B. Brownlee, treasurer. The officers are temporary and will serve for the first 90 days. It is intended to work the Silver Lake and Snow Drift Mining claims in Summit Valley, just north of the Moulton and adjoining the Margaret Ann and Glengarry.

## NEVADA.

### ELKO COUNTY.

#### TUSCARORA DISTRICT.

COMMONWEALTH MINING COMPANY.—In week ending Jan. 3 the east crosscut on the fourth level was advanced 23 feet, cutting several seams showing some ore. Ore worked at Union mill, 11 tons; battery assay, $120 13, including concentrates from 65¼ tons concentrating ore, assaying $27.52 per ton.

NAVAJO MINING COMPANY.—The work of retimbering has been finished, and stopes have been started each way from the winze near the turntable, 350-foot level east. The vein is small, but the ore is of very high grade. The company had an indebtedness on the 1st inst. of $14,925.15, but there is due the company $12,800 by other corporations for pumping water.

### ESMERALDA COUNTY.

HOLMES MINING COMPANY.—According to Superintendent Jackson's report the first intermediate, west stope, over second shaft level, is producing consideraole ore assaying about 23 ounces. The stope 200 feet east of point 6 winze is producing some ore assaying 33 ounces, while about 20 tons assaying 27 ounces are daily taken from the Corkill stope. A winze sunk on the eleventh level, under the Yankee stope, is now down 40 feet; there is a two and a half foot streak of ore in the bottom assaying 49 ounces. This new development is considered of great importance. The tenth level stope is producing considerable ore assaying 24 ounces, and that in the little tenth level is looking well; ore worth about 50 ounces is taken out. Small seams assaying 28 ounces are reported in the face of the Sutherland tunnel. Further information regarding this mine will be found below.

MT. DIABLO MINING AND MILLING COMPANY.—Superintendent Shockley reports that the stope on the east drift on the sixth level looks well, showing nearly three feet of $60 ore. The ore in the west drift in the winze between the fifth and sixth levels is now three feet wide and assays $60. There is very little ore in the face of the east drift from this winze. The west drift from the south crosscut on the fifth level is in 41 feet and the face shows one foot of $100 ore. Work has been commenced in the face of the east drift on the fourth level, with a little ore showing. The stopes on the second east show no special change, and are giving the usual amount of ore. The intermediate stope between the first and second east shows but little ore. The west stope between the first and second levels shows some improvement. The repairs have been completed at the mill, and it is now running again.

### LINCOLN COUNTY.

DAY.—It is reported that another large body of ore has been opened in the workings in this mine above the tunnel. A crosscut has been driven for 18 feet and no walls found. It is soft stuff, and they are taking out from that point 15 tons a day. Assays running from 60 to 600 ounces in silver per ton have been made from the body, and the whole, it is thought, will average over 100 ounces in silver per ton.

PIOCHE MINING AND REDUCTION COMPANY.—The Day mine, owned by this company, was abandoned by the Day Mining Company in 1884, because the grade of the ore was not high enough. The old company took out from the discovery some 500 tons of ore, averaging 20 ounces per ton in silver. The vein was then followed down for high grade ore. Afterward an 800-foot tunnel was driven, tapping the ledge 360 feet below the croppings. The present owner purchased the property last spring, and set to work to open it further. Large quantities of low grade material were left standing by the old company, and it is expected that work on a large scale will soon be commenced.

### STOREY COUNTY.—COMSTOCK LODE.

The promise of good results from the pumping operations in Gold Hill is really good, says the Virginia *Enterprise*. When deep mining was being carried on in that section things looked bright. A drift was sent out from the 2,200 level of the Crown Point toward the Exchequer line, but the miners were drowned by a flood of hot water as soon as they struck a strong body of pay ore, and before they had commenced to explore a very promising looking body of ore in the Belcher mine. This makes two bodies of ore in existence about which there is no question, excepting as to their extent. It is proposed by means of the present pumping operations to prospect these, and to this extent they are working for a certainty.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—Reports of a strike in this property which have had currence are denied by the superintendent. The usual quantity of ore, only, is being extracted from the 1,200, 1,300, 1,600 and 1,650 levels. The total production for week ending January 3d was 1,620 tons and 1,700 pounds of ore, which was shipped to the Eureka mill. The average assay value of all the ore worked at that mill during the week (1,605 tons) was $17.90 per ton.

(From our Special Correspondent.)

### ELKO COUNTY—TUSCARORA DISTRICT.

SAN FRANCISCO, January 8.

The Union mill closed down last week for the winter, after making a bullion shipment valued at $29,000 to joint account of Commonwealth, North Commonwealth, Belle Isle and North Belle Isle companies. The productive mines will continue to ship second class ore to the Grand Prize concentrator. An idea of the ore which has been extracted may be gained from the last week's run at the mill, which was as follows: Commonwealth, 11 tons, average $120.13 per ton; North Commonwealth, 21 tons, average $154.55; Belle Isle, 15 tons, average $265.11; and North Belle Isle, 26½ tons, average $101.37.

### ESMERALDA COUNTY.

HOLMES MINING COMPANY.—Another bullion shipment of 4,513 ounces was made on the 2d. The mine is yielding the usual amount of ore, assaying from $25 to $53 per ton, and the Candelaria mill is kept steadily at work.

### STOREY COUNTY—COMSTOCK LODE.

On February 25th, 1889, the legislature of Nevada passed an Act to require foreign corporations and associations to name and keep agents in this state, (Nevada) upon whom all legal processes may be served. This law has hitherto been ignored, but now most of the Comstock Mining Companies, acting under legal advice, are appointing their superintendents as such agents.

The following assessments have been levied within the last week; 30 cents on Sierra Nevada; delinquent February 5th, 35 cents on Kentucky, delinquent on February 3d; 25 cents on Union Consolidated, delinquent February 5th, and 50 cents on Hale and Norcross, delinquent February 12th.

ALTA MINING COMPANY.—The mine belonging to this company shut down on the 6th inst., and yesterday the mill stamps were hung up. By this course 50 men have been thrown out of employment. The exhaustion of ore resources above the Sutro Tunnel (1,030 level) is given as the main cause. The largest ore reserves are located in the flooded levels, and the directors being in possession of most of the stock have not seen fit to assess the stock to pay for the cost of drainage, more particularly, as from present appearances, it seems as if the operations on the Crown Point incline will benefit the Alta property without expense to the stockholders. It is not unlikely, however, that some arrangement will be made with the Pumping Association, when the Alta pumps can be started up within 24 hours.

BENTON CONSOLIDATED COMPANY.—The property of this company was sold last week by the sheriff upon an execution upon judgment in favor of the Alta Mining Company. The plaintiff bid in the property for $9,666 70. The Benton company has six months under the law to redeem the property. A rather peculiar feature of the difficulty in which the Benton company is involved is the fact that at the last annual meeting held in July, there was $83,836.49 reported in the treasury. It was unkindly reported at the time that this sum was largely represented by personal notes and I. O. U.'s, but this, it is alleged, was contradicted at the time by the secretary. As work has been practically at a standstill, and the money cannot have been expended on the mine, the question is being asked, where has this large sum of money gone to?

CROWN POINT MINING COMPANY.—The heating of the compressed air before being admitted to the pumps has remedied the freezing and choking that took place in parts of the pumps. The vertical distance from the 1,500-foot level to the surface of the water is about 62 feet, the water having been lowered 9 feet last week. Since the pumps have been in operation the water in the Alta shaft in Devil's Gate district has lowered 10 feet, showing that there is an open fissure between the two points.

SAVAGE MINING COMPANY.—During the holiday week notice was served upon this corporation by M. W. Fox, through his attorney, intimating that 19½ feet of Savage ground, an undivided interest, had passed into his possession, and that suit was about to be commenced to compel the company to give an accounting of the $4,500,000 disbursed in dividends, and also to restrain the company from extracting ore from the mine without setting apart a pro rata apportionment for the interest claimed. Mr. Fox figured prominently before the public a short time when he instituted suit against the Hale & Norcross Company, and embodied in his complaint a number of specific charges of the most startling character, which have already been set forth in the ENGINEERING AND MINING JOURNAL. The present suit promises to be equally interesting, although in a different way, and will in all probability hinge upon a decision rendered in 1860 in the District Court at Carson, then in the Second Judicial District of Utah. The association of mining men, even then known as the Savage Company, although it was not an organized corporation, included many men who have since become noted in mining and financial circles. Among others were Senator George Hearst, E. A. Head, W. F. Walton, G. Lancaster, J. S. Meredith and some half a dozen others. Realizing that they held the Savage ground under an alleged cloudy title, a suit was instituted to dispose of adverse claims, they basing their right to the mine under a location made by Savage and Carmack in July, 1859. By stipulation a majority verdict was to be accepted, but the jury unanimously found for the defendants, Bowers and Rogers, who were proved to have been, with J. Webb and C. A. Hammack, the original locators, they having filed their claim on the 21st of May, 1859—Savage and Carmack having no further right than that they had "jumped" the claim two months later. The Savage Company, having met with this reverse, proceeded to acquire a legal title by purchase, and succeeded in buying the rights of the several claimants under the Bowers-Rogers location with the exception of the 19½ feet now brought into question. This undivided interest in what has been a most productive mine has passed through a number of hands, but with one exception the holders have been in every instance too poor to push their claim to a share in the dividends that for a long time were regularly declared. The one exception was Judge Bryan, of the Superior Court of Nevada. He instituted suit similar to the one now about to be commenced by Mr. Fox, but unfortunately he died while the case was still pending, and as assessments have been much more frequent than dividends in recent years, his heirs disposed of the interest while laboring under the idea that it was worth very little and certainly not worth spending money to enforce it in a court of law. Having passed into the hands of P. E. Shannon, he in turn has now sold it to M. W. Fox, who, it is said, is of the opinion that aside from his claim to a pro-rata share of all dividends paid out, there is an ore body in the mine which has not been worked for the interest of the stockholders, but in which he has a direct interest and which he does not propose to see made away with for the benefit of the "mill-ring," without protest. Some interesting points of law will be raised by this case.

## NEW MEXICO.

### SIERRA COUNTY.

The Good Hope mine, employing 50 men, and the Snake and Opportunity mines, employing together about 75 men, have suspended shipments on account of the higher smelting rates now exacted, and will, for the present, employ only enough men to keep the mines in good order. It is likely that the Mamie Richmond and Garfield mines will also close down.

CHLORIDE MINING AND REDUCTION COMPANY.—This company has been incorporated by A. F. Childs, J. G. Blaine and J. Don. Cameron; Charle

B. Johnson, of Philadelphia, and W. Wright, of San Francisco. Capital stock, $1,000,000. Principal place of business at Chloride.

### OHIO.

FRANKLIN COUNTY.

CENTRAL OHIO NATURAL GAS AND FUEL COMPANY.—This company notified its 1,300 domestic consumers at Columbus, on the 13th inst., that the gas would be turned off the next day. The pressure became so low on the 13th that many fires in the city went out, and the company feared serious accidents should they endeavor to continue under these circumstances. The continued cold weather has caused an unusual draft on the wells at Thurston, 26 miles east of the city.

### PENNSYLVANIA.

PHILADELPHIA AND READING COMPANY.—The annual report of this company for 1890 shows the operations of the railroad were as follows: Gross earnings, $20,934,487, against $19,018,613 in 1889; total net income, $9,534,064, against $8,869,420, and surplus, after all charges, $2,040,378, against $1,213,212. The Coal and Iron Company earned gross $18,920,773, against $17,818,225 in 1889. After deducting expenses and interest on bonds the year's operations resulted in a deficit of $973,284, against $974,373 last year.

GAS.

A few days ago the Gaily well, 40 rods southwest of the Pittsburg & Lake Erie station at Corapolis, was reported dry, but since then it has been drilled to the fourth sand. On the morning of the 13th this sand was reached, and for a few minutes a stream of oil burst forth. This soon changed to gas. Experienced operators claim it is the biggest gas well ever struck south of the Ohio, and that the rock pressure is 800 pounds to the square inch.

OIL.

The Standard Oil Company has now to meet another attempt at opposition. A fund of $500,000 has been raised by a combination of oil producers with which one or more independent oil refineries and pipe lines will be constructed. The greatest care has been exercised to provide rules for the government of the association that will guard its property against the Standard, either through the forcing down of the market or by the bribery of members. The independents are said to control the greater part of the lower oil fields. They say they have been driven to this move by the action of the Standard in forcing the price of crude oil down to about 60 cents a barrel, which they claim to be less than the cost of production.

The Chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States for the month of December, 1890, as compared with similar exports during the corresponding periods of the preceding year, as follows: December, 1890, $3,956,831; December, 1889, $4,493,776. Twelve months ending December 31st, 1890, $51,657,302. Twelve months ending December 31st, 1889, $52,792,473."

BUCKS COUNTY.

It is said that the oil well at Nockamixon has reached a depth of 1,560 feet, and has just passed through a vein of anthracite coal, nine feet thick. The original contract with the drillers was for a depth of 1,500 feet, but another contract has been made for 600 feet additional. The well is being bored with the hope of finding oil. The finding of a strong vein of coal is causing great excitement among landowners in that vicinity and values are advancing rapidly.

### SOUTH DAKOTA.

HARTSHORN.—This property is patented and incorporated under the laws of Dakota, the capital stock, $1,250,000, is divided into shares, $5 each. Improvements consist of a shaft house and steam hoisting works. The shaft is 180 feet deep, well timbered to the bottom, and has drifts therefrom aggregating 350 feet, with a good showing of ore on the lower levels. The ores exposed black sulphurets, gray carbonate and dry ores. The dry assay $15.25 gold and 56 ounces silver, and the lead ores carry varying quantities of silver. On the lower levels the indications are encouraging. This property is about 600 feet from that owned by the Iron Hill Mining Company. President Bullock, general manager of the latter, says in his annual report that "the ore bodies on the 100, 160 and 300 foot levels run southeasterly and northwestly," which would carry the zone ore directly through the Hartshorn property for at least 800 feet.

LAWRENCE COUNTY.

A recent discovery of an extensive body of lithographic stone is said to have been made in the vicinity of Hot Springs on what is known as Odell Cañon, three miles due east of the Minnekahta Hotel. The rock seems perfectly solid and of superior quality. On Dudley Cañon the same stone has been found, developments on which are very encouraging. Several specimens of the stone have been exhibited in Deadwood, and experts say that it is a first-class article.

WELLS-FARGO No. 2.—This property, owned by R. M. Maloney, is situated at the head of Blacktail gulch. A shipment of 20 tons and 600 pounds of ore is reported to have been made a few days since to the Omaha smelting works. Returns were received showing the gross value to be $1,125.11. Railroad charges and treatment cost $290.11, and hauling of the ore from the mine to the railroad depot $83, thus resulting in a net profit of $752, less cost of mining. A large body of this ore is said to be in sight, but the probability is that it will be reserved for home treatment.

### UTAH.

BEAVER COUNTY.

HORN SILVER MINING COMPANY.—The ore from this mine is being stored at present. It is reported that the management prefers that to accepting the prices offered during the temporary stringency of the money market. Horn Silver ore is not high in lead, and, as the smelters are paying $4 and $5 per ton above actual values for ore running 50% and over, and offering a corresponding amount less for ores having only 28% to 35% lead, this ore is not readily marketed at satisfactory prices.

EMERY COUNTY.

PLEASANT VALLEY COAL COMPANY.—This company is getting out coal at Castle Gate with the aid of mules until the machinery damaged by the explosion can be repaired. Everything will be running as before in about two weeks.

JUAB COUNTY.

TREASURE AND JULIAN LANE.—John A. Shettle is operating these mines at Tintic. From the former he is shipping an average of 300 tons per month and from the Julian Lane 100 tons. This ore runs about 15 ounces silver and 38 to 40 per cent. lead. The shipments from these two properties last year were a little over 3,000 tons of ore.

UTAH COUNTY.

SILVER BELL MINING COMPANY.—This company is making good progress in driving its 2,000-foot tunnel. It has run in the vein now for 400 feet, most of the way in ore which assays 35 ounces silver. A shaft has been sunk 475 feet, and levels run from it at 95, 195 and 295 feet, opening the vein for 200 feet on its strike. The vein is from four to six feet wide. A streak from 12 to 18 inches wide is first class ore and the balance low grade. It is probable that a mill will be erected at the property before long.

TREASURE CONSOLIDATED MINING COMPANY.—This company has driven a tunnel in its property in American fork a distance of 400 feet. A drift, driven 100 feet from this last week, struck an ore body four feet wide which assayed 30 per cent. lead and 70 ounces silver. The ore is soft and shows silver chloride. In the vein there is a thin streak of galena running about 70 per cent. lead and 200 ounces silver. The face of the tunnel is getting into softer ground, with bunches of galena, giving better promise for the property than at any time before.

### WYOMING.

The State Senate has passed a bill requiring owners or operators of coal mines to pay all employés every two weeks.

A bill has also been passed providing that no one under 14 years of age shall be employed, and that eight hours shall be a day's work in and around coal mines.

CONVERSE COUNTY.

SHAWNEE.—These coal mines, which are owned and were formerly operated by the Chicago & Northwestern Railway Company, about 20 miles east of Douglas, are to be reopened and will be extensively operated by that company.

## FOREIGN MINING NEWS.

### AUSTRIA.

The report reaches us that recently an explosion of fire-damp took place in Trinity pit, near the Polish town of Ostraw. Fifteen bodies have been recovered, and 24 miners are missing. Three hundred and fifty other men in the mine escaped by an air shaft. It is feared that the accident will result in the death of 40 miners as it is impossible without considerable work to rescue those still living in the mine.

### BRITISH COLUMBIA.

The exports of coal from Nanaimo for December were as follows:

| | Tons. |
|---|---|
| New Vancouver Coal Company | 31,269 |
| Wellington | 8,044 |
| East Wellington | 2,370 |
| Union Mine at Comas | 4,490 |
| December | 46,173 |

The New Vancouver Coal Company makes the following report for the year 1890:

| | Tons. |
|---|---|
| Output | 389,076 |
| Shipments, domestic and foreign | 339,63 |

This company has assumed the leading place in the coal trade of British Columbia. There were no interruptious to work throughout the year, and its record is the best ever made, either by this or any other British Columbia coal company. The quantity of coal exported from British Columbia in 1890 was as follows:

| | Tons. |
|---|---|
| New Vancouver Company | 289,359 |
| Wellington | 103,977 |
| Union | 58,393 |
| East Wellington | 36,445 |
| Total exports, foreign | 488,174 |

The Wellington mine was practically closed down from June 1st to October 1st by a strike among the miners. At $4 per ton this represents a value of $1,952,696. At least $500,000 should be added for coal used locally.

### CANADA.

To simplify entries of machinery not manufactured in Canada, and to obviate, if possible, the tedious and vexatious delays that have been characteristic of recent interpretations of the meaning of the tariff law on mining machinery, the following Order in Council, under date of 28th ult., was issued: "His Excellency, under the authority of Section 252 of the Customs Act, and by and with the advice of the Queen's Privy Council for Canada, is pleased to order that there be required, in addition to such other evidence in each case as may be deemed necessary by the Minister of Customs, a special oath to be subscribed to by the importer before a Collector or other proper officer of Customs, whenever any free entry is rendered of Mining Machinery under item 291 of Sec. 11 of the Act 53, Vic., Chap. 20, such oath to be in the following terms: "I, ....., the undersigned importer of the machinery mentioned in this entry, do solemnly swear that it is Mining Machinery within the true meaning of the word, and that at the time of its importation was of a class and kind not manufactured in Canada, and that it is imported for use in ..... mining only, at the ..... mine, situated ....., in the Province of ....., and will be used for no other purpose whatever."

The coal shipments from Cape Breton in 1890 reached 900,000 tons, against 700,000 the year previous. Following is a detailed statement of shipments:

| Mines. | Tons. | Mines. | Tons. |
|---|---|---|---|
| Old Sydney | 150,000 | Little Glace Bay | 109,000 |
| Victoria | 75,000 | Caledonia | 145,000 |
| International | 135,000 | Ontario | 10,000 |
| Reserve | 140,000 | Gowrie | 126,000 |
| Bridgeport | 26,000 | | |

The shipping arrivals at North Sydney reached 1,800 sail, aggregating 700,000 tons, as compared with 1,400 sail and 500,000 tons the years previously.

PROVINCE OF NOVA SCOTIA.

The Stellarton (N. S.) *Journal* gives the following tabulated statement of shipments of coal from the various collieries:

| | 1889. | 1890. | Increase. |
|---|---|---|---|
| *Cumberland County.* | | | |
| S. Hill | 366,860 | 376,550 | 9,690 |
| Joggins | 37,935 | 53,482 | 15,547 |
| Chignecto | 13,650 | 7,485 | D. 6,176 |
| Sundries | 1,300 | 1,500 | 200 |
| *Pictou County.* | | | |
| Drummond | 119,873 | 120,000 | 127 |
| Acadia | 101,018 | 106,097 | 5,079 |
| Albion | 52,668 | 67,434 | 14,766 |
| Vale | 76,146 | 68,586 | D. 7,560 |
| Black Diamond | 32,390 | 32,301 | D. 89 |
| Muir's | 1,125 | 1,360 | 235 |
| *Cape Breton County.* | | | |
| Bridgeport | 24,000 | 25,000 | 1,000 |
| Caledonia | 103,000 | 145,000 | 42,000 |
| Glace Bay | 74,000 | 109,00 | 35,000 |
| Gowrie | 100,000 | 125,000 | 25,000 |
| International | 118,000 | 135,000 | 17,000 |
| Ontario | 3,000 | 9,000 | 6,000 |
| Reserve | 110,000 | 139,000 | 29,000 |
| Sydney | 124,000 | 150,000 | 26,000 |
| Victoria | 91,000 | 75,000 | D. 16,000 |
| Sundries | 3,000 | 3,000 | ..... |

*Totals.*

| | | | Increase. |
|---|---|---|---|
| Cumberland | 1889. | 419,745 | |
| " | 1890. | 439,011 | 19,266 |
| Pictou | 1889 | 383 220 | |
| " | 1890. | 395,778 | 12,558 |
| Cape Breton | 1889. | 750,000 | |
| " | 1890. | 915,000 | 165,000 |

*Grand Totals.*

| | | |
|---|---|---|
| 1889. | 1,552,965 | |
| 1890. | 1,749,789 | |
| Increase, 1890. | 196,824 tons. | |

The increase for the year 1890, 196,824 tons, is gratifying. It is said that shipments for 1890 would have been even larger than they are if the weather had not turned extremely severe two or three weeks before it was expected shipments would cease. Shipments to the United States are estimated to have reached nearly 50,000 tons.

(From our Special Correspondent.)

GOLD.

HALIFAX, Jan. 13.

The *Critic* in reviewing the course of mining in Nova Scotia during the year 1890, remarks that from the information at its disposal the returns of gold will probably prove less than in 1889. It has been a speculative year, and a number of mines have been well developed on the surface with crushers, engines, etc. Several good mines have been closed pending the outcome of legal proceedings. In spite of these drawbacks, many old properties have continued to pay under careful and economical management. The Lake Lode Company, of Waverly, has operations now fairly un-

der way. The yield of its veins runs about 5 pennyweight to the ton on a monthly crush of about 1,000 tons. No recent discoveries of veins have been reported. At this season little prospecting is done.

COAL.

Incomplete returns as received to date give the following figures as the sales of the principal Nova Scotia coal mines during the year 1890:

| | Tons. | | Tons. |
|---|---|---|---|
| Springville | 376,550 | Caledonia | 145,000 |
| Joggins | 53,482 | Glace Bay | 109,000 |
| Intercolonial | 120,000 | Gowrie | 125,000 |
| Acadia | 242,117 | International | 135,000 |
| Black Diamond | 32,301 | Reserve | 139,000 |
| Cape Breton Co. | | Sydney | 150,000 |
| Bridgeport | 25,000 | Victoria | 75,000 |

The total estimated increase over the preceding year is over 200,000 tons. The collieries are all in good shape, and banking out coal will probably be commenced in Cape Breton at the end of this month. The Nova Scotia collieries are kept fairly busy with local and railway demands.

GYPSUM.

The shipments from Windsor and vicinity amounted to 147,685 tons against 145,358 tons in 1889. Returns from other ports will add somewhat to the increase.

IRON.

The amount of iron ore, manganese, etc., will probably be about the same as in 1889. During the ensuing year it is expected that there will be a decided increase in coal sales and in the iron business, as it is hoped and expected that the Pictou furnaces will be in blast by the early part of next summer.

PROVINCE OF ONTARIO.

It is understood that the Ontario Government intends increasing the price for Crown lands sold as mining locations in the unsurveyed territory within the districts of Algoma, Thunder Bay, Rainy River, and that part of the district of Nipissing lying north of French River, Lake Nipissing, and Maltawa River, owing to the recent discovery of nickel, copper and other ores in the above localities.

UNITED KINGDOM.

The British Coal Miners' Federation has made proposals to the Mine Owners' Union to discuss the question of eight hours, with a view to compromise. The owners claim that on account of the great advance in miners' wages they cannot consent to eight hours without losing all prospect of profit.

## MEETINGS.

Crocker Mining Company, at No. 309 Montgomery street, San Francisco, Cal., January 19th at 1 P. M.

Elkhorn Coal and Land Company, at No. 2 Wall street, New York City, January 27th, at 12 o'clock noon.

Lehigh Valley Prospecting, Mining and Smelting Company, at No. 86 Trinity Place, New York City, January 22d, at 12 o'clock noon.

Lone Star Quartz and Gravel Mining Company, at No. 2814 Sacramento street, San Francisco, Cal., January 17th, at 2 P. M.

Maid of the Mist Mining Company, at 120 Broadway, New York City, February 2d, at 2 P. M.

Maryland Coal Company, at No. 35 Broadway, New York City, February 3d, at 11 A. M.

Mammoth Mining Company, at No. 163 Southeast Temple street, Salt Lake City, Utah, February 3d, at 2 P. M.

Sulphur Bank Quicksilver Mining Company, at No. 306 Montgomery street, San Francisco, Cal., January 19th, at 12 o'clock noon.

## ASSESSMENTS.

| COMPANY. | No. | When levied. | D'l'nq't in office. | Day of Sale. | Amn't per share. |
|---|---|---|---|---|---|
| Adelaide Cop., Nev. | 2 | Dec. 27 | Jan. 31 | Feb. 18 | .06 |
| Atlantic Con., Nev. | .. | Nov. 11 | Dec. 29 | Jan. 19 | .25 |
| Brunswick, Con., Cal | 1 | Jan. 8 | Feb. 10 | Mar. 6 | .02 |
| Con. Imperial, Nev. | 30 | Dec. 13 | Jan. 13 | Feb. 9 | .05 |
| Crown Point, Nev. | 53 | Dec. 3 | Jan. 7 | Jan. 28 | .50 |
| Del Monte, Cal. | 4 | Jan. 5 | Feb. 9 | Mar. 3 | .20 |
| Exchequer, Nev. | 30 | Dec. 11 | Jan. 15 | Feb. 5 | .25 |
| Hale & Nor., Nev. | 97 | Jan. 7 | Feb. 11 | Mar. 4 | .50 |
| Head Center Con., Ariz. | 5 | Dec. 12 | Jan. 15 | Feb. 6 | .03 |
| Humboldt, Nev. | 2 | Nov. 19 | Dec. 27 | Jan. 24 | .06 |
| Kentuck, Nev. | .. | Dec. 29 | Feb. 3 | Feb. 25 | .35 |
| Locomotive, Nev. | .. | Dec. 15 | Jan. 22 | Feb 10 | .05 |
| Lone Star Con., Cal. | 2 | Dec. 29 | Feb. 7 | Mar. 2 | .00½ |
| Potosi, Nev. | 35 | Dec. 16 | Jan. 20 | Feb. 10 | .50 |
| Riverside, Cal. | 1 | Dec. 11 | Jan. 12 | Feb. 2 | .10 |
| Sierra Nev., Nev. | 98 | Jan. 2 | Feb. 5 | Feb. 24 | .30 |
| Union Utah | .. | Dec. 6 | Jan. 10 | Jan. 28 | .01 |
| Utah Con., Nev. | 11 | Dec. 9 | Jan. 19 | Feb. 9 | .25 |

## DIVIDENDS.

Illinois Steel Company, dividend of five per centum, payable February 19 at the office of the Metropolitan Trust Company, No. 37 Wall street, New York City. Transfer books close January 20 and reopen February 20.

Mammoth Mining Company, dividends No. 28 of 10 cents per share, $40,000, payable January 19 at the office of the Company, No. 25 South Main street, Salt Lake City, Utah.

## MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 107 and 108.

NEW YORK, Friday Evening, Jan. 16.

The cloud with the silver lining which was expected to reflect a soft effulgence upon the hopeful members of the Consolidated Exchange made its appearance on Thursday, but the effect which it produced was quite different from that which had been prophesied. Heretofore the current remark has been, "Wait until we have free coinage of silver and then look out for mining stocks." The news that the Senate had passed an out-and-out free coinage bill struck the market amidships, and so startling was the news that even its advocates hardly realized the scope of the measure. It can be said with truth that a feeling of distrust was created, and values with the exception of one class of stocks seemed depressed. The silver men of the board are jubilant over the progress which silver legislation has thus far attained, and claim that the bill is sure to pass the House and become a law. The present inactivity, they claim, is due to a natural unsettled feeling, which will disappear as the measure is understood. There is probably no doubt of the existence of the unsettled feeling, and the level-headed financiers of the street claim that it will continue to be unsettled even if the bill becomes a law. As is natural under the circumstances, there is considerable inquiry concerning stocks and there is good reason to believe that investors and speculators are getting ready to get into the market. In the meantime it may be noted that the effect of the passage of the Free Coinage bill in the Senate was a decline of one cent an ounce in the market price of silver, as shown in our market report.

The number of shares sold during the week as compared with previous week's record will bear out this statement that there is at present a public distrust, and a desire to wait until a more definite conception of the measure is formed. They aggregate 34,510 against 83,650 shares of last week. Of this number but 7,921 shares were of dividend payers. The Comstocks were the feature of the market, because of their general activity as well as marked increase in values. These stocks have been climbing during the past three weeks, doubtless under manipulation and in anticipation of a free coinage act. It is not surprising, therefore, that a spurt is made just at this time. The fact that they are going up seems to lend cheer to brokers who are handling other stocks. The hopeful feeling seems to be universal and the bearish element is decidedly insignificant. If the stockholders should all unite in the suits against the mill ring there would be a large dividend in store for most of the stocks.

Of the Comstocks, Alta was fairly active, closing the week on sales of 1,000 shares at $2.30, a rise of $1.50 over the closing prices on Thursday night. Best & Belcher was in greater quest and rose to $2.70 on Thursday, closing at $2.65, an increase of 5 cents over last week's price. Consolidated California and Virginia rose to $4.90 on Wednesday, dropping back to $4.10 on very light sales, a gain of 75 cents over last week. Crown Point was inactive but gained 25 cents, closing at $1.95. Hale & Norcross sold at $2.00, being a gain of 50 cents. Ophir closed at $3.55, a gain of 35 cents on very light sales. Savage enjoyed a rise of 55 cents, 75 cents of which took place on to-day's transactions. Our readers should consult our Mining News Column concerning this mine.

Sierra Nevada rose to $2 and declined to $1.90 on very light sales; the closing price last week was $1.45. Yellow Jacket closed the week's transactions at $2.30, a net gain of 45c. Chollar opened the week at $2.15, closing at $2.60 on light sales. Comstock Tunnel showed a lack of public confidence; it gained 1c. on Wednesday, selling at 51c. Julia lost 1c. on active sales, closing at 29c. Mexican closed at $2.50, last week's price. Occidental was neglected; the light sales experienced raised the price to 90c., a gain of 20c. Potosi recorded but a single sale of 10 shares on Wednesday at $4.10; this was 65c. below last week's prices. Scorpion gained 5c. to 25c. on small sales. Union Consolidated experienced one sale on Saturday at $2. Utah sold on Wednesday at 85c., a gain of 5c. It can be said of these stocks that the largest number of sales occurred on Wednesday, and the most radical rise in prices on Friday.

Eureka on light sales rose $1.25, to $3.50.

The Tuscaroras can be said to have not been in the market. There is only one sale to be recorded, that of North Belle Isle, which experienced a single sale of 100 shares at 60c., a drop of 15c.

Of the Amadors, Astoria was active, opening at 4c., dropping to 3c., rising to 5c., and closing at 4c. on active sales. Middle Bar was the active stock of the week, opening at 7c., dropping to 4c., and closing at 5c., the closing price of last week. Sutter Creek held its own through the week at $1.10. If the Belmont Gold Mining Company is admitted to the Exchange, and it is said to be quite probable that it will be Sutter Creek, the company it succeeds, will, of course, be withdrawn. Amador had one sale of 300 shares at 5c.

Of the Bodie stocks the only one which received any attention was the Bodie Consolidated, which experienced a sale of 100 shares at 95c., a loss of 5c.

Coppers appeared in the market after weeks' absence, but received exceedingly small sales. There seems to be a feeling that the copper market is gradually working itself into tangible shape. Calumet and Hecla sold at $261.25: Kearsarge at $11.88; Osceola, $35.12; Quincy, $93.50, and Huron, $3.25.

Of the Colorado stocks but little can be recorded. Scorpion on small sales advanced 5c.@25c. Chrysolite sold at 25c., a gain of 1c. The sales were light. Leadville chief gained 1c., closing at 13c. on sales of 1,000 shares.

Brunswick was active at 8c.@9c., closing at the latter figure. This company has levied an assessment of 2c. of which notice is given in another column. The announcement seemed to be expected, as it did not depress the quotations.

Plymouth was inactive at $2.

Mutual Smelting and Mining was active, opening at $1.50, last week's closing price, closing at $1.40 on sales of 1,900 shares.

Phœnix of Arizona opened at 59c., rose to 65c. on Wednesday, and closed at 60c., 2c. over last week's prices, on sales of 5,800 shares.

Caledonia sold at 60c. Sales were light. It was not quoted last week.

Horn Silver enjoyed a single sale at $3.10, a rise of 10c. over last week's prices.

Silver King had one sale of 100 shares on Wednesday at 20c.

Stormont sold on Friday at 6c.

### Boston. Jan. 15.

(From our Special Correspondent.)

There has been a little more activity in copper stocks the past week, and prices in some specialties show a slight increase incident to a better feeling prevailing in copper circles and easier money. Calumet & Hecla has ruled firm at $258 to $260, and not much stock offered. The product last month was about 850 tons, showing that the decline in November output was purely accidental.

Boston & Montana declined to $40 during the week, but rallied again to $42, closing off to day at $41.

Butte & Boston was quite strong, and advanced from $14¾ to $17, losing a portion of the advance to-day, selling at $16⅛.

Centennial advanced from $15 to $18 on the favorable reports concerning the outlook at the mine. The advance was too rapid to be sustained, and a decline followed to $16¼.

Kearsarge was also inquired for, and small orders advanced the price from $11½ to $12½, which was well maintained.

Good buying of Osceola sent the price up early in the week to $36¼, followed by a reaction to $33¾. To-day the stock was strong at $35¾, but closed with the loss of the fraction.

Quincy sold in small lots at $93@$95.

Tamarack has been very quiet, with sales at $148@$150, mostly at the latter figure.

Atlantic continues to be in fair demand at $15½@$16.

Santa Fe advanced from 40c. to 45c., closing at 42½c.

Allouez has been rather neglected the past week. Rumors of an assessment caused a decline to $1⅞. But very little stock could be had at that figure, and orders to purchase it advanced the price to $2⅛@$2⅜, and that price did not bring out much. There has been no official announcement of an assessment, and all alleged official interviews, to the effect that there has, can be authoritatively pronounced as fakes.

National advanced from $2¾ to $3⅛ on the encouraging telegrams received from Captain Vivian regarding the outlook at the mine.

The silver stocks are a little more inquired for. Dunkin sold at 65c. and Catalpa at 25@27½c. There were no sales of Breece at the Stock Exchange, but we hear of sales outside at 40c.

*By Telegraph.*—Calumet and Hecla, $260; Tamarack, $145; Montana, $41; Osceola, $35.

### Denver. Jan. 12.

(From our Special Correspondent.)

The market during the week, with the exception of Saturday, was decidedly weak, prices and sales of small amounts, and an uneasy feeling prevailing. Saturday and to-day proved much better in tone and dealing, and undoubtedly will improve in time. Messrs. M. Sussman and M. Siegle, of Australia and San Francisco, are about to open an office here to deal in margins, not only in home but other companies, and, as they are going to do this on a large scale, it will eventually create considerable business for the exchange. Some few

the properties that were suspended for non-payment of yearly dues have been reinstated.

There are a few of the low priced stocks being called daily at figures ridiculously low, and a rule should be adopted that when a listed property, placed and called upon the board for Treasury stock, declines so far below Treasury stock price, it should have an examination into its affairs—both financial and for development work—performed. Considerable attention should also be given to the amounts expended for development work, raised from sales of Treasury stock that was to be used for that purpose. If it had been spent for that purpose there should have been better results from many of the properties that really have bright outlooks.

Prices and sales for week ending Jan. 10th.

| Company. | Opening. | H. | L. | Closing. | S. |
|---|---|---|---|---|---|
| Alleghany, Colo | 20a | 28 | 10b | 10½ | ..... |
| Amity, Colo | 01½b | *02 | 01¼ | 01¼ | 3,700 |
| Bangkok, C. B., Colo | 04b | 05 | 03¾ | 04 | 4,600 |
| Bates-Hunter, Colo | 55 | 59 | 51 | 59 | 14,500 |
| Brownlow, Colo | 04¾b | 05 | 04¼ | 04¾ | 800 |
| Calliope, Colo | 21b | *26 | 23 | 24 | 1,700 |
| Cash, Colo | 10b | 10b | 10b | 10 | ..... |
| Clay County, Colo | 93b | *99 | 91 | 92 | 2,700 |
| Hard Money, Colo | .... | .... | .... | .... | ..... |
| Leavenworth | 70 | 70 | 69 | .... | 100 |
| Little Rule, Colo | 93 | 96 | 92 | 96 | 3,100 |
| Matchless, Colo | .... | 250 | 100 | 100 | ..... |
| May-Mazeppa, Colo | 113b | *119 | 111 | 117 | 6,800 |
| Mollie Gibson, Colo | .... | .... | .... | .... | ..... |
| Oro, Colo | 50b | 53b | 47b | 53 | ..... |
| Pay Rock, Colo | 03¼b | 03¾ | 02¼ | 02¼ | 1,650 |
| Puzzler, Colo | .... | .... | .... | .... | ..... |
| Reed-National, Colo | 71a | 67 | 67 | 69 | 200 |
| Running Lode | 20 | 20 | 19 | 18¾ | 2,000 |
| Silver Cord, Colo | 35a | 35a | 20b | .... | ..... |
| Whale Cove | .... | .... | .... | .... | ..... |
| Prospects. | | | | | |
| Argonaut, Colo | .... | 15b | 10b | 15 | ..... |
| Aspen United, Colo | .... | .... | .... | .... | ..... |
| Big Indian, Colo | .... | 12a | *08a | .... | ..... |
| Big Six, Colo | 01 | *05 | 03¼ | *03¼ | 3,100 |
| Century, Colo | 35a | 35a | 19b | 19 | ..... |
| Claudia J, Colo | .... | 03½ | 03 | .... | 5,500 |
| Nat. G. & Oil Co | 08b | *10½ | 08½ | 08¾ | 2,200 |
| Diamond B., Colo | 01 | †01¾ | ¾ | †01¼ | 3,000 |
| Emmons, Colo | †12b | †13 | 37½ | *11 | 1,800 |
| Golden Treasure, Colo | 16b | 16½ | 14 | 15 | 4,200 |
| Ironclad, Colo | 02b | 02½ | 02¼ | 02 | 200 |
| John Jay, Colo | 10a | 19a | 01½b | .... | ..... |
| Justice | 15a | 09 | 09 | 09 | 400 |
| Legal Tender, Colo | *15a | *02½ | 02 | 02 | 500 |
| Morning Glim, Colo | 48b | 51 | 49 | 48 | 600 |
| Park Consolidated | 15b | *21 | *18 | .... | 500 |
| Potosi, Colo | 03½b | 03¾b | 03¾b | 03¾ | ..... |
| Rialto, Colo | 60 | 60 | 60 | .... | 500 |

Total for the week ..... 80,20

*Buyer 30 days. †Buyer 60 days. ‡Seller 60 days. §Seller 30 days a Asked. b Bid.

### Lake Superior Iron and Gold Stocks.

IRON MINING STOCKS.

| Name of Company. | Par value. | Bid. | Asked |
|---|---|---|---|
| Anvil Iron Co | ..... | $3.00 | $3.25 |
| Ashland Iron Co | $25 00 | 60.00 | 66.00 |
| Aurora Iron Co | 25 00 | 8.50 | 9.50 |
| Brotherton Iron Co | ..... | 3.00 | 3.25 |
| Champion Iron Co | 25 00 | 80.00 | 85.00 |
| Chandler Iron Co | 25.00 | 38.00 | 39.50 |
| Chicago & Minn. Ore Co | 100.00 | 113 00 | 117 00 |
| Cleveland Iron Co | 25.00 | 17.00 | 18.00 |
| East New York Iron Co | ..... | 2 00 | 2.25 |
| Germania | 25.00 | 11.50 | 12.00 |
| Jackson Iron Co | 25 00 | 110.00 | 125.00 |
| Lake Superior Iron Co | 25.00 | 70.00 | 75.0 |
| Milwaukee Iron Co | 25.00 | ..... | ..... |
| Minnesota Iron Co | 100.00 | 77.00 | 78.00 |
| Montreal Iron Co | 25.00 | 9.00 | 10.00 |
| Norrie (Metropolitan) | 25.00 | 70.50 | 72.00 |
| Odanah Iron Co | 25.00 | 17.00 | 18 00 |
| Pittsburg Lake Angeline Co | 25.00 | 160.00 | 170.00 |
| Republic Iron Co | 25.00 | 27.00 | 29. 0 |
| Section "33" Iron Co | ..... | 20.50 | 21.00 |

GOLD MINING STOCKS.

| Name of Company. | Par value. | Lowest. | High. |
|---|---|---|---|
| Gold Lake M. Co | ..... | .... | ... |
| Grayling Gold & Silver Co | $25.00* | .... | .. |
| Michigan Gold Co | 25.00* | .... | .... |
| Peninsula Gold & Silver Co | 25.00* | .... | |
| Ropes Gold & Silver Co | 25.00 | $2.00 | $2.25 |

* Quotations nominal.

### San Francisco. Jan. 8.

(From our Special Correspondent.)

The opening week of the new year has witnessed spasmodic attempts at a revival of activity in Comstock shares. No news from the mines has warranted the rally among the North End stocks, although the mining outlook has for some time past justified higher prices than have been ruling. Consolidated California & Virginia has led the advance, and has sold to $3.15, with heavy sales during the informal sessions. Rumors have been rife to the effect that a strike of some little importance had been made in the mine, and this report, coming at the time when it was expected that J. Mackay would be coming West, served to inflate the stock. There is no reason to suppose any development of importance has taken place in the Consolidated Virginia, and the fluctuations are such as indicate no very strong faith in the rumor by the street. Mexican has sold to $2.35, Ophir to $2.90 and Sierra Nevada to $1.65, with ready sales at these figures. The leading Gold Hill stocks have also touched higher figures, in sympathy with the North End movement; but, rather strangely, Potosi, Bullion and Chollar, the three stocks that have monopolized attention for so long, have been selling quietly at steady prices. Small sales of Potosi have been made to-day at $4.50—a slight advance over previous values for the week—while Chollar has sold readily at $1.90 and Bullion at $2.05. So far no trading of any consequence has been done in outside stocks, and the levying of several assessments recently has tended to depress the general market.

### St. Louis. Jan. 14.

(From our Special Correspondent.)

The week started out very poorly with only 700 shares sold for the first day, and by Saturday the total sales amounted to only 5,100, but by Monday the market had regained its strength, and sales were higher than the average. For Monday and Tuesday the total number of shares sold was 31,100.

Granite Mountain was inactive during the week and no sales were made. It is quoted at $41.50. The regular shipment amounted to 20 bars, containing 58 ounces of gold and 26,550 ounces of silver.

Bi-metallic was in demand this week at $32.

Aztec was revived this week and with bidding beginning at 4c. reached 9c. before the week was out—no sales.

Nellie had a bid of 20c., but holders wanted 30c.

American & Nettie opened the week at 40c., advanced to 42½c., and closed at 41¼c. During the week a sale of 400 shares at 41½@42½ was made.

Breen was the attraction this week, and advanced well in price. Opening at 80c., it fell to 78¾c., but so on regained its former footing. During the week it came forward strongly, reaching 92½c., but to-day it falls again to 88¾c.; 13,700 shares were sold during the week, the bulk of them going at 90@92½c.

With the going up of Breen, its rival, the Elizabeth, went down, and closed 12½c. lower than the opening bid. It is now quoted at $2.32½. During the week 10,900 shares were sold. The market is very weak.

Central Silver was another stock in good demand, and though it did not advance much its sales were very good. It opened at 4c. fell to 3½c., and closed at 6c. Total number of shares sold this week amounted to 11,900.

Little Albert was more prominent this week, and 200 shares were sold. The market was very firm, and mounted from 16¼c. to 20c.

Ingram had a sale this week of 200 shares at 80c. Present quotation, 70c.

Montrose was another stock that was dealt in the first time for several weeks. Seven hundred shares were sold at 60@62c. The market opened at 55c. and closed at 60c.

Small Hopes advanced from 80c.@82c. Its stockholders held a meeting on January 12th, and the following board of directors was chosen for the year 1891: J. C. Porter, H. F. Niedringhaus, J. O. Broadhead, John Block, W. F. Bovle, L. H. Conn, W. Chandler, C. L. Cune, L. Dutro, G. Augst, E. Miller, G. F. Shapley and H. B. Laudermann.

## PIPE LINE CERTIFICATES.

(Specially reported by Messrs. WATSON & GIBSON.)

The petroleum market this week has not shared in the enthusiasm of the stock market, and the speculative sentiment of Wall street which has been growing in fervor for the last two weeks has not infected petroleum. There was a slight advance in the price of Ohio oil, but transactions in it were merely nominal, and in Pennsylvania oil there has been only a little doing, and that at irregular prices. There is nothing new to say concerning the situation. We see no reason to advise purchases of either of the oils on the market and believe that they will both sell down again.

NEW YORK STOCK EXCHANGE.

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|---|---|---|---|---|---|
| Jan. 10 | 73⅝ | 73⅝ | 73⅛ | 73⅛ | 8,000 |
| 12 | 73¼ | 73¼ | 73¼ | 73¼ | 20,000 |
| 13 | 74 | 74 | 74 | 74 | 20,000 |
| 14 | 73⅞ | 7 3/8 | 73⅞ | 73⅞ | 5,000 |
| 15 | .... | .... | .... | .... | ..... |
| 16 | 74½ | 74½ | 74½ | 74 | 11,000 |
| Total sales in barrels | | | | | 64,000 |

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|---|---|---|---|---|---|
| Jan. 10 | 73¾ | 74⅛ | 73¾ | 74⅛ | 6,000 |
| 12 | 73½ | 73⅞ | 73⅜ | 73⅝ | 26,000 |
| 13 | 73¾ | 74⅛ | 73¾ | 74 | 14 000 |
| 14 | 74¼ | 74¼ | 74 | 74 | 18,000 |
| 15 | 75½ | 74 | 73¼ | 73½ | 31,000 |
| 16 | 72⅞ | 73⅜ | 72½ | 72½ | 53,000 |
| Total sales in barrels | | | | | 148,000 |

## COAL TRADE REVIEW.

NEW YORK, Friday Evening, January 16.

STATEMENT of shipments of anthracite coal (approximated) for the ten days ending January 10th, 1891, compared with corresponding period last year:

| Regions. | Jan. 10, 1891. | Jan. 11, 1890. | Difference. |
|---|---|---|---|
| Wyoming Region. Tons | 512,416 | 430,667 Inc. | 91,749 |
| Lehigh Region " | 156,922 | 188,941 Dec. | 32,019 |
| Schuylkill Region " | 279,877 | 297,663 Inc. | 214 |
| Total Tons | 959,215 | 917,271 Inc. | 59,944 |

PRODUCTION OF BITUMINOUS COAL for week ending January 10th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

| | 1891. Week. | 1891. Year. | 1890. Year. |
|---|---|---|---|
| Phila. & Erie R.R | 2,051 | 4,292 | 3,622 |
| Cumberland, Md | *79.632 | *105,376 | 107.529 |
| Barclay, Pa | *2,634 | 5.167 | 2,500 |
| Broad Top, Pa | 9,447 | 12,273 | 18,565 |
| Clearfield, Pa | 81, 14 | 158,072 | 154,680 |
| Allegheny, Pa | 19,189 | 38,205 | 34 502 |
| Beach Creek, Pa | *14,893 | 90,772 | 37,807 |
| Pocahontas Flat Top | 36,631 | 5 ,618 | 54,997 |
| Kanawha, W. Va | *41,217 | 85,473 | 62,100 |
| Total | 317,008 | 550,248 | 476,392 |

* Estimated.

WESTERN SHIPMENTS.

| | | | |
|---|---|---|---|
| Pittsburg, Pa | 21,586 | 48,117 | 32,057 |
| Westmoreland, Pa | 34,931 | 59,263 | 51,025 |
| Monongahela, Pa | 14,886 | 16,364 | 9,770 |
| Total | 71,373 | 123,744 | 9?,852 |
| Grand Total | 388,381 | 673,992 | 569,244 |

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending January 10th, 189?, and year from January 1st, in tons of 2, 00 lbs.: Week, 33,886 tons; year, 134,137 tons: to corresponding date in 1890—177,428.

### Anthracite.

The transactions of the week have not materially changed the general condition of the market. The scarcity of soft coal, chronicled in a previous issue, has had the effect of bringing steam sizes of anthracite into quest, several sales being reported to the ocean steamship lines, which are soft-coal burners.

Stove coal is in active demand, although in small lots, indicative of the hand-to-mouth policy of the retailer who has about exhausted the stock which he put in early in the season at lower prices, and who is averse to buying large quantities under ruling conditions. Chestnut is said to be a drug in the market except with firms having a western outlet. On the whole, sales are not so active as during the week previous, while the movement of stocks seems to be freer, a condition of affairs which is not exactly relished by the agents.

A meeting of the sales agents was held on the 13 inst. It is reported to have been one of those informal mutual-admiration-society gatherings, from which eminate naught but a good understanding of the causes which govern the trade. It was learned from a gentleman who was in attendance that in consideration of ruling conditions or the market rather more coal was being supplied than was conducive to healthy trade. The decision reached was that the output should be kept within a certain limit.

As stated in our issue of January 10th, the sales agents fixed the January output at 2,500,000 tons. While these monthly limits are very good guide-posts, ruling conditions are taken as a sufficient warrant for deviations. It is hinted that the outcome of the meeting was of a nature to call agents' attention to this figure. Prices as given below will be sustained. It should not be inferred that the action of the agents was prompted by an unsteady condition of the market. It is simply inclined to lethargy. It is believed that a tonic like the one mentioned will have the desired corrective effect.

The moss-backed chestnut "an anthracite pool of individual operators," bobbed up serenely during the week. Whether by means of a desire on the part of a few malcontents to gain cheap notoriety or through a belief that they would have a following, cannot be stated, because of the short-lived agitation. A central agency for the sale of coal is not to be classed among the possibilities at present. In addition to the probable legislation which would oppose such a combine, would be arrayed millions of capital. Anthracite coal presidents have been taught by a very emphatic experience that "in unity there is strength."

Prices range about as follows f. o. b.: Stove, $4.15; egg, $3.90; broken, $3 65; chestnut, $3 75. The smaller sizes still continue in best demand. Of these we quote: Buckwheat, Lehigh, $2; pea, $2.60 to $3.

### Bituminous.

Spot soft coal continues to command fancy prices, nevertheless it can be said that the situation is being eased by the somewhat greater supply of cars which are now being utilized to move stocks to tide water. These cars are available by reason of a closing of furnaces and coke ovens. The condition of affairs in the mining regions, brought on by inclement weather, although bettered, is not yet favorable, and the future, dependent upon the elements in a marked degree, is anything but certain.

There can be said to be few or no sales at the present time. The usual quota is moving, but it is mostly to meet contracts. Would-be purchasers are "not in it" as far as the market is concerned. To complicate the situation the agents, through a desire to maintain prices, and in accordance with an agreement, refuse to sell for delivery after March 1st. Consequently, to the outsider at least, the future of the market is very uncertain. To offset the prevailing scarcity, the supplies are now available through the closing of furnaces. The stock on hand is not large. Jobbers who are short seem to feel that an improved condition of affairs is not far off.

The outlook for an early settlement of the labor troubles in the Clearfield region is said to be

promising. The meeting of the operators and men is to take place on the 22d inst., at which time differences will be considered. The minority which is in favor of the present scale seems to be growing in numbers. It is stated that the probable settlement will be of a nature which will insure the steady operation of the mines of the district.

The Sea Board Coal Association, to which reference was made in our last issue, is far from assuming tangible shape. On the part of co-operators the chief objection to the association seems to center in the lack of a person of executive ability who has the time to devote to its management. If it does come into existence the date will be April 1st.

About one-third of the coke ovens in the Connellsville region are now idle. As was chonicled in these columns, the price of this coke was reduced 25c., to $1.90, for the month of January. It will be placed at the old figure of $2 15 on February 1st, with the expectation of keeping it there.

It is authoritatively stated that railroads have notified shippers that they must not enter into new contracts upon a basis of last year's figures. The companies claim that the margin upon which they have been operating is too small. Freights will be shoved up from 15c. to 25c. a ton.

Baltimore and Philadelphia freights to the East are now quoted at $1.20@$125. Considering the few sales, it is difficult to quote prices. The following scale is nominally followed: At Baltimore, $2.85 f o b.; at Philadelphia, $2 95; at New York, $3.30, and alongside, $3.50. We look for but little change in the market during the present month.

### Buffalo. Jan 15.

(From our Special Correspondent.)

At the annual meeting of the members of the Merchants' Exchange, yesterday, the following report from Mr. J. J. M. Williams, the chairman of the committee on coal, was read:

The shipments of anthracite coal by lake during the season 1890 amounted to 2,106,775 tons, being some 30,000 tons more than during the season 1889, and about 400,000 tons less than in the season 1888. The stocks in the West at present are such that with an average winter we may expect a largely increased movement by lake in the coming year.

Freights ruled remarkably steady during the entire season. For Lake Michigan, opening on April 2d at 50c, they remained so until the arrival of the grain fleet from Chicago, when they dropped to 40c.; upon May 9th they rose to 60c., at which point they remained until November 3d, when 75c. was paid on a few cargoes.

The average rate to Chicago for the season was 61c. net ton as against 55c. net ton for the previous year. The average rate for the the season to Lake Superior also was higher than the year before, being about 40c. as against 35c. in 1889. The rate to Toledo was 35c. as against 30c. in 1889.

It is presumed that about as much anthracite coal is shipped west by all rail routes from mines through to the Western market as is shipped by lake.

It is estimated that about the same amount of anthracite coal is consumed yearly in the city of Buffalo as has been during the last four or five years.

Natural gas is being used to about the extent of the increased demand caused by the increasing population. Now that it has been found much nearer Canada than in Pennsylvania, the effect of the introduction of the foreign element will be watched with interest.

The dock facilities for transferring coal from cars to vessels at Buffalo are not to be equaled at any other point. A fleet bringing 2,000,000 bushels of grain, arriving all in one day, will here find elevators that can easily unload them, and they can all be loaded with coal and not detained beyond 24 hours. There are now two fueling barges in Buffalo that can load the soft coal for fuel into the steamers while they are unloading grain at the elevators or loading their freight at the coal pockets, thus enabling the steamers to escape any detention by taking in their fuel.

The lake craft are handled very expeditious, as is well known. As an example of what can be done, the steel steamer "America" arrived in port early one morning with 100,000 bushels of corn, and left before the day ended with a cargo of 2,700 tons of coal, having also received 200 tons of fuel meanwhile.

The storage plant of the Philadelphia & Reading, at East Buffalo, calculated to store 250,000 tons under cover and 100,000 tons outside, is practically ready for receiving the coal. That of the Lehigh Valley at Cheektowaga, with an estimated storage capacity of 150,000 tons, is approaching completion.

By many well posted on bituminous matters in the Buffalo market, the season of 1890 is considered one of the most satisfactory on record. Early in the year the railways advanced the freight rate from the mines to Buffalo from 90 cents to $1.10 per ton. The miners also advanced their prices for coal at the mines 5 cents to 10 cents per ton, and consequently the market prices throughout the season have ruled about 30 cents per ton higher than 1889. This advance was also felt in foundry coke from the Connellsville and other regions.

The advance in prices was made possible by the natural and steady increase in the consumption of soft coal and coke here, the falling off of the natural gas supply in Pittsburg, and also by the increasing demand in the Eastern and Western markets, which absorbed the surplus from mines and coke ovens which was formally unloaded upon the Buffalo market.

At no time during the season has there been an overstock of soft coal or coke in Buffalo, and, as a rule, the Bituminous Coal Exchange at its meetings has found its members to be buyers and not able to supply all their requirements. The bituminous coal men think the days of the ruinously low prices have passed, and that 1890 ushered in a better era for them. It is difficult to estimate the increase in the consumption of coal in Buffalo, as no separate account is kept by the railroads of the coal used for the local market. It would be very desirable if they would arrange to keep such a record of such shipments in the future.

At the election of trustees held at the close of the meeting Mr. Robert R. Helford, the well-known coal miner, dealer and shipper, was elected a member for the current year.

### Chicago. Jan. 14.

(From our Special Correspondent.)

The present stock of anthracite in this market is very low, and values should hold more steadily than they do at present. Some low figures have been made on unmerchantable lots, which has led to some cutting, but with the short supply in view and continuance of winter weather, prices will, probably, be more firmly adhered to. A season of severe cold weather would undoubtedly deplete the market.

Wholesale prices are f.o.b. Chicago: Large egg, $5.50; small egg, range and chestnut, $5.75; Lehigh lump, $7.

The retail prices fixed by the Chicago Coal Exchange are: Large egg, $6.75, small egg, range and chestnut, $7.

The bituminous market is in somewhat better condition, but the demand is singularly light for the season even from industrial sources. Prices are fairly steady, and quotations per ton of 2,000 pounds are: Erie, $4.25; Pittsburg, $3.40; Indiana block, $2.50; Blossburg, $3.90; Greene and Sullivan county (Ind.), shaft, $2.25@$2.40; Jackson Hill, $3.50; Jackson shaft, $3.50; Hocking Valley, $3.30; Youghiogheny, $3.40.

**Coke.**—The reduction in prices reported last week has not stimulated sales as yet to any great extent. Supply and demand are about equal, with no surplus stocks. Quotations are: Connellsville, 72 hours, $5 05; domestic, crushed, $4@$4.25; Elk Lick, 72 hour, $4.25@$4.50 per ton of 2,000 pounds f.o.b. Chicago.

### Pittsburg. Jan. 15.

(From our Special Correspondent.)

**Coal.**—The firmness noted for some time continues, and the continued shortage of gas makes business lively among coal dealers. The strike along the Monongahela Valley continues; both sides are firm. The railroad mines are in full operation; their scale does not expire until May 1st. The local trade and the mills are supplied by rail. Prices nominal; railroad coal, per 100 bushels, $5@$5.50; river, wholesale, $4.50@$5.

**Connellsville Coke.**—The coke question remains unsettled; the prospect at this writing is favorable for a compromise. With 26 valley furnaces closed, waiting for cheaper coke and lower rates of transportation, the outlook is not very brilliant. There are thousands of idle ovens in the regions. Week's shipments: Points west of Pittsburg, 2,850 cars; Pittsburg and river points, 1,940 cars; points east of Pittsburg, 1,400 cars; total, 6,190 cars or 111,420 tons.

Price of coke:

| New rates. | | Founders | 230 |
|---|---|---|---|
| Furnace | $190 | Crushed dealers | 250 |
| Dealers | 215 | Crushed consumers | 265 |

Freights are unchanged to all points.

### FREIGHTS.

**From Philadelphia to:** Boston, 1.00@1.15; Charleston, 1.10; Galveston, 2.25; New Bedford, .75.; New Orleans, 2.25; Providence, .75; Washington, † .85.

† Alongside.

## METAL MARKET.

NEW YORK, Friday Evening, Jan. 16.

**Prices of silver per ounce troy.**

| Jan. | Sterling Exch'ge | Lond'n Pence. | N. Y. Cts. | Jan. | Sterling Exch'ge. | Lond'n Pence. | N. Y. Cts. |
|---|---|---|---|---|---|---|---|
| 10 | 4 86 | 48¼ | 1.05¼ | 14 | 4.86 | 48⅛ | 1.06 |
| 12 | 4.86 | 48⅛ | 1.06¼ | 15 | 4.87 | 48⅛ | 1 05 1.05¾ |
| 13 | 4.86 | 48¾ | 1.06⅝ | 16 | 4.88 | 48 | 1.05½ |

Silver has been held steady within the fluctuations of a small compass—checked in its advance by the prospect of all silver legislation defeating itself, and held up from the lower prices to which it would gravitate, by the confidence of those who feel that the so-called friends of the metal will succeed in getting some new vantage ground before the present Congress adjourns.

It is noteworthy that the passage of the Free Coinage bill by the Senate caused a decline of a cent an ounce in the value of silver.

The United States Assay office at New York reports total receipts of silver for the week to be 96,000 ounces.

### Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

| | Bid. | Asked |
|---|---|---|
| Trade dollars | $ .80 | $ .82 |
| Mexican dollars | .82 | .83 |
| Peruvian soles and Chilian pesos | .74 | .76 |
| English silver | 4.80 | 4.84 |
| Five francs | .94 | .95 |
| Victoria sovereigns | 4.83 | 4.87 |
| Twenty francs | 3.84 | 3.88 |
| Twenty marks | 4.74 | 4.78 |
| Spanish doubloons | 15.55 | 15.70 |
| Spanish 25 pesetas | 4.80 | 4.85 |
| Mexican doubloons | 15.55 | 15.70 |
| Mexican 20 pesos | 19.50 | 19.60 |
| Ten guilders | 3.96 | 4.00 |
| Bar silver | 1.05⅛ | 1.06⅛ |

### Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

| | Price. H. | Price. L. | Sales. |
|---|---|---|---|
| Jan. 10 | 106 | 105¼ | 380.0 0 |
| Jan. 12 | 107⅝ | 106¼ | 683.000 |
| Jan. 13 | 107⅜ | 106⅜ | 316,000 |
| Jan. 14 | 107¼ | 104 | 884 000 |
| Jan. 15 | 107¾ | 105⅛ | 579,000 |
| Jan. 16 | 106⅝ | 105½ | 193,000 |
| Total sales | | | 3,035,000 |

### Government Silver Purchases.

The Treasury Department informs us that the amount of silver purchased during the past week was as follows:

| | Amount offered Ounces. | Amount purchased. Ounces. | Average price. |
|---|---|---|---|
| Jan. 12 | 583,800 | 283,800 | $1·0671 |
| Jan. 14 | 918,000 | 455,000 | 1·0604 |
| Department purchases Jan 1st to Jan. 14th | | | 3,500,400 |
| Local purchases Jan. 1st to Jan. 10th, inclusive | | | 178,614 |
| Total for month to date, ounces | | | 3,679,014 |

**Copper.**—The market continues in a lifeless condition, and while the price of 15c., which the Lake companies have fixed, is nominally upheld, we hear of no orders having been placed at that figure, except perhaps for some wire bars and cakes, and this can only have been to a very small extent. This condition is easily explained by the fact that large purchases, which were made by manufacturers in the fall, and which were then supposed to cover legitimate demand, have since proved to have been partly of a speculative character, and a number of the manufacturers are left with a great deal of copper on their hands. To these the reduction of the price to 15 cents is anything but agreeable. Besides, there is evidently enough copper being hawked about at 14½@14¾ to meet any demand, but even these outside lots are not being taken care of. We have not heard of any sale of Lake copper for export within the last week, but we understand that same is still being offered for export on the basis of 13½@13¾, with no business resulting.

As to outside brands, it is reported that a large quantity of Arizona pig copper, which formed part of the late syndicate's stock, has been sold at under 11 cents, part of which will be exported. The demand for this grade of copper has fallen off considerably, and the difference in price as compared with Lake is as great as ever. The price for casting copper is 12 cents, but this figure can probably be shaded on purchases of a wholesale character.

London is showing a firmer tendency, and while it closed a week ago at £51 10s.@£51 12s. 6d. spot, and £52 2s. 6d. for three months, it opened on Monday at £52 2s. 6d.@£52 5s. spot, and £52 12s. 6d. @£52 15s. three months, since when it has steadily advanced, closing to-day at £52 17s. 6d.@£53 spot, £53 7s. 6d.@£53 10s. three months. It is claimed that the firmness must be attributed to a report that the Rothschilds have taken a financial interest in the Anaconda Mine. This is being considered a bull point in as far as this great banking concern should again take an interest in the metal notwithstanding the disastrous results to their interests in the famous syndicate.

The reports we have received indicate, however, that the Rothschilds have merely made heavy advances on Anaconda product, and have taken an option of purchase on the property, this option running a year.

Exports of copper to the other side continue rather heavy, and this explains that while G. M. Bs. have improved in price, the demand for refined copper is at a standstill. European buyers can not, evidently, make themselves familiar with the idea that copper should experience a legitimate advance as long as we continue to transfer to them our surplus. We quote: Tough copper, £55; best selected, £58@£59; strong sheets, £64@£65;

India sheets, £59@£60; Yellow metal sheets, 5½d. @6d.

The exports of copper during the past week were as follows:

| | | | |
|---|---|---|---|
| To Liverpool— | Copper matte. | Lbs. | |
| By S. S. Greece..... | 6,429 bags. | 722,244 | $60,000 |
| To Liverpool— | Copper. | | |
| By S. S. Wisconsin ..... | 244 bars. | 33,634 | 5,045 |
| To London— | | | |
| By S. S. Italy..... | 28 pigs. | 4,504 | 500 |
| To Hamburg— | | | |
| By S. S. Scandia..... | 16 bars. | 1,002 (c.bul.) | 2,600 |
| " " ..... | 54 casks. | 67,500 | 9,000 |
| To Antwerp— | | | |
| By S. S. Rhynland..... | 715 pigs. | 225,884 | 27,000 |
| To Havre— | | | |
| By S. S. La Gascogne .. | 230 casks. | 287,000 | 41,780 |
| " " .. | 373 bars. | 50,056 | 8,000 |
| To Hamburg— | Copper matte. | | |
| By S. S. Bohemia..... | 1,138 bags. | 119,881 | 10,000 |
| To Amsterdam— | Copper. | | |
| By S. S. Werkendam... | 36 casks. | 46,080 | 6,000 |
| To Rotterdam— | | | |
| By S. S. Werkendam... | 40 casks. | 50,000 | 7,500 |

**Tin.**—The market has been very steady, and but little business has been done during the week. The silver debates have not exercised the least influence on the market. We quote spot at $20.25, January at $20.25, February at $20.35, March at $20.40.

The London market opened at £91 5s.@£91 7s. 6d. spot, and £91 17s. 6d.@£92 futures, and closes at £91 7s. 6d.@£91 10s spot, £91 17s. 6d.@£92 futures.

**Lead** made a further step toward higher prices, especially so in the West, where the demand is exceptionally good and the offerings rather limited. The position of the metal must be called a very sound one, in as far as there are no stocks of much account anywhere in the country, and not only that, but it also seems evident that consumers have not very great supplies on hand. Considering that the demand is usually very slack during the present month, it is but natural to conclude that if consumption increases next month prices will advance to a point where importation will again be possible, and perhaps necessary.

Certain negotiations now going on between the smelters are expected also to improve the condition of these and strengthen the market.

Sales in the New York market have been made at from 4·40c.@4⅝c., and while the market closed to-day a little easier with small transactions at 4·55c., the Western market continues very strong and sales are reported at 4·35c.@4⅝c. St. Louis, and 4·40c.@4·42½ Chicago.

An officer of the Lead Trust is reported to have stated in reference to the prospects of a dividend on Lead Trust certificates, that there was no change in the situation, and that the Board of Trustees had not as yet had the matter brought before them for action, and that there was no telling whether a dividend would be declared or not.

*St. Louis Lead Market.*—Messrs. John Wahl & Sons' Company telegraph us as follows: "Lead is firm and rather a scarce article. Owing to restriction offering prices have further advanced. Sales for the week will probably aggregate 500 tons at from 4·75c. to 4·35c.

*Chicago Lead Market.*—Messrs. Everett & Post telegraph us as follows: "Market has ruled steady during the week at 4·35@4·40c. Producers generally have not been free sellers, neither has there been any particular inquiry from consumers. Sales foot up less than 200 tons for the week.

**Spelter.**—Values have again weakened, not so much on account of lower offerings, but for want of demand. The galvanizing trade is exceedingly dull, and the few smelters who are eager to place some of their product have to take prices on as low a basis as $5.60, New York, and some of the less liked brands are selling at a little less than that.

The London market is 22·10 for Ordinaries and 23 for Special.

**Antimony.**—The demand has improved somewhat, but prices are still on the decline. We quote LX. at 17½, and Hallett's at 16½; Cookson, 18¼.

## IRON MARKET REVIEW.

NEW YORK, Friday Evening, Jan. 16.

In general the iron market presents the same features as last week and the week before, prices having remained, in most cases, unchanged and the demand not having materially increased. Different opinions are expressed by different dealers. Some cannot see any prospect of improvement, while others are inclined to take a brighter view and look for better things before long. The improvement in the financial situation has certainly had a great effect upon the tone of the market, which will, undoubtedly, soon become more apparent if things are not again set in a turmoil by the pending silver legislation. The consumption of iron is undoubtedly large, and the same routine of business continues in most lines, although in some there are more inquiries, and prospects of a somewhat increased demand, evidently from the consumers who allowed stocks to run down at the end of the year.

**American Pig Iron.**—There continues to be the same number of furnaces out of blast in Alabama, Tennessee and the Mahoning Valley as we reported last week. The strike in the South appears to be virtually over, but it is hardly likely that all of the idle furnaces will blow in again immediately, in view of the present condition of the market which is plainly overstocked, and the present prices of pig iron can be but little more than the cost of production in many of these places.

In the market there seems to be rather more inquiries and a trifle more active demand, which is an encouraging feature. Prices remain unchanged, and we quote, as last week: Northern iron, No. 1x, $17.50@$18; No. 2x, $16.50@$17; Southern, No. 1x, $16.50@$17.50, and No. 2x, $15.50@16.50.

**Scotch Pig Iron.**—The only arrival of the week was a lot of 200 tons, all of which has gone into consumption. The only Scotch irons now easily obtainable are Eglinton and Carnbroe. Dalmellington is uncertain, while the stock of Summerlee, in Glasgow, has been entirely exhausted. We quote as follows: Dalmellington, $22.50@$23; Eglinton, $20.50@$21; Carnbroe, $21.

**Spiegeleisen and Ferro-Manganese.**—The market is very dull, and there have been no transactions of consequence during the week. We quote nominally for 20% spiegeleisen, $29; 80% ferro-manganese, $65. There have been pot lots sold at slightly lower figures, but no orders of consequence could be placed at lower prices than we quote.

**Steel Rails.**—The all-absorbing topic of interest in this market is the consolidation of two of the rolling mill companies, and the practical combination that has been effected between all of the producers. The Lackawanna Coal and Iron Company and Scranton Steel Works, which have been strong and active competitors, have now joined hands.

This reduces the number of producers to six; the Lackawanna Coal and Iron Company, Bethlehem Iron Company, Cambria Iron Company, Pennsylvania Steel Company, Carnegie, Phipps & Co. and the Illinois Steel Company. Representatives of these concerns met in this city on Thursday and an agreement to regulate production was then effected, which practically amounts to a combination to raise prices, and as a consequence sellers are already asking from $29@$30 for rails.

**Rail Fastenings.**—There is no demand, and prices remain unchanged. We quote nominally: Spikes, 2·00c.; angle plates, 1·70@1·80c.; bolts and square nuts, 2·75c.; hexagonal nuts, 3·00c.; complete joint, iron and steel, according to weight.

**Tubes and Pipes.**—There is but little change in the market. Business continues fair for this season of the year. We quote discounts on carload lots as follows: 47½% on butt, black; 40% on galvanized; 60% on lap, black; 47½% on lap galvanized; boiler tubes: 45% on 1¾ inch and smaller; 50% for 2 inch and larger; casing, all sizes, 50%.

**Structural Iron and Steel.**—Business continues very dull, owing chiefly to the present money market, which is against building operations. We quote as last week: Universal plates, $2.20; bridge plates, $2.15; angles, $2.20; beams, $3.10.

**Merchant Steel.**—Business continues to show improvement, and there is now no such difficulty in selling large lots as a few weeks since. Prices remain unchanged, and we quote: Best English tool, 15c., net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel 5c.; crucible spring, 3¾c.; open-hearth machinery, 2·60c.; open-hearth spring, 2·60c.; tire steel, 2·60c.; toe calks, 2·60c.; flat file, 4½c.; mill file, 4½c.; taper file, 7c.; first quality sheet, 10c.; second quality sheet, 8c.

**Old Rails.**—The market is very dull, there being no buyers and no sellers. Prices continue nominal at $23 for tees and $25 for doubles.

**Wrought Iron Scrap.**—The market is very quiet, and there are transactions in small lots only. We quote from $21@$22.

### Chicago. Jan. 14.

(From our Special Correspondent.)

The general condition of the iron and steel market of Chicago is improved, although some lines are still much depressed, and will continue so until the financial situation becomes settled. Prices are so low that manufacturers will undoubtedly take advantage of the present condition of the market to contract supplies for their spring and summer consumption. In all lines of the iron trade in this market business is still reported dull, and collections, as they have been for the past two months, extremely slow, being the result, of course, of the great stringency which has so long affected the money market.

**Pig Iron.**—The demand for pig iron is gradually improving. Coke iron, in small lots for prompt delivery particularly, is also in demand. The outlook for a large consumption of metal is very encouraging, although prices still remain low, with no prospect for a rise. Lake Superior charcoal has been offered at less than the usual figures, but only under pressure for the purpose of realizing.

We quote to-day for cash per ton of 2,240 pounds, f. o. b. Chicago, for Nos. 1 and 2, Lake Superior charcoal No. 3, for car wheels, Nos. 4 and 5 for malleable, $18.50@$19; Lake Superior coke, Bessemer, $18.50; Lake Superior coke, Bay View No. 1, $16.50; No. 2, $16; No. 3, $15.50; Southern coke, No. 1, $16@$17; No. 2, $15.50@$16; No. 3, $14.75@$15.50; Southern charcoal, $19@$19.50; standard Southern car wheel, $22@$24.50; Ohio softeners, Hanging Rock, $18@$18.50; Jackson County, $18.25@$18.50; Hanging Rock, cold blast, $26@$28; warm blast, $23@$25; No. 1 Scotch, according to brands, $26@$27; American Scotch, $18.50@$19; Bay View Scotch No. 1, $18; No. 2, $17; Chicago Scotch, No. 1, $17; No. 2, $16; Emma Scotch, $18.50@$19; black band, Hubbard Scotch, $18.25; Hazelton, $18.50; Soft Silvery, $18; Wellston, No. 1, $18 75; No. 2, $18.25; Hamilton, No. 1, $19.25@$19.75; Norton, No. 1, $17.50@$18; Zanesville, No. 1, $18.75@$19.25.

**Structural Iron.**—Demand continues good, and the outlook is excellent. The new Masonic Temple will consume about 4,000 tons of iron and steel in its construction.

Prices are firm without change. For car lots, f.o.b. Chicago, iron and steel angles, $2.35@$2.40; universal plates, $2.50; sheared plates, $2.50; tees, $2.80@$2.90; beams and channels, $3.20. Store prices are: Angles, $2.50@$2.60; tees, $3@$3.10, and beams and channels, $3.50@$3.70, according to quantity.

**Bar Iron.**—Bar iron shows no sign of improvement as yet. The demand is only for small lots for sorting up stocks, etc. Local and near by mills quote $1.70@$1.75 on miscellaneous lots, half extras, and valley mills $1.65 at mill with extras added.

**Black Sheet Iron.**—Black sheets are in very small demand, and business is of a very quiet nature. Mills quote $2.85 for No. 27 common, f.o.b. mill. Jobbers quote $3.20 from store for No. 24, $3.30 for Nos. 25 and 26, and $3.35 for No. 27.

**Galvanized Sheet Iron.**—Demand is improving and warehouse stocks are getting into better shape. Discounts remain at 62½% on Juniata, and 62½ and 5% on charcoal from store.

**Merchant Steel.**—Some inquiry for car lots is reported; otherwise business is very quiet. Stocks in jobbers' hands are said to be small. Prices are unchanged. We quote as follows: Tool steel, $7.75@$8; specials, $12@$25; open-hearth machinery, $3, Bessemer machinery, $2.50@$2.70; open-hearth spring steel, $2.75@$2.80; tire, $2.50@$2.60; toe calk, $2.70@$2.80; sleigh shoe, $2.40@$2.50; cutter shoe (T. & B.), $2.65@$2.70; crucible sheet steel, $7@$10; crucible spring, $3.75.

**Plates, Tubes, etc.**—The demand from stores continues very fair and some inquiry is noted from the country. Quotations are: Tank iron, $2.70; tank steel, $2.90; heavy sheets from 10 to 14, $2.90@$3; steel sheets 10 to 14, $3.25@$3.50; shell iron, $3@$3.25; flange iron, $4@$4.25; flange steel, $3.50; shell steel, $3.25; boiler rivets, $4@$4.25; firebox iron and steel, $4.75@$5.50; boiler tubes, 4½ inches and larger, 52½%; 2 to 4 inches, 50%, and 1¾ inches and smaller, 45%. Mill prices are perhaps a shade easier to cash buyers.

**Nails.**—Steel cut are in moderate demand and prices are more firmly adhered to. Wire nails are more quite, but in better demand. The former are quoted at $1.85@$1.90 in small lots, and the latter at $2.35 with the usual deduction on mixed car loads.

**Steel Rails.**—Steel rails are in moderate request in small lots for prompt delivery. Railroads are very backward in placing orders for renewals and extensions, but as soon as full confidence in the money market is restored an improved condition of things is expected. There are no changes to be noted in prices previously reported which remain at $30@31.50 f. o. b. Chicago.

**Railway Track Supplies.**—Demand is limited to small lots only. No change in quotations, which are: Iron fish plates, $2.05@$2.10; steel fish plates, $2.25@$2.30; bolts, square nuts, $3; hexagon nuts, $3.08@$3.10; spikes, $2.20@$2.25.

**Scrap Iron.**—A better feeling in this market is noted among dealers, but values are still weak. Railroads have sold most of their large accumulations of old material, and there are fewer offers to sell. We quote as follows: Country mixed scrap, $15.50@$16.50, according to condition; No. 1 mill, $14@$14.50; light wrought, $9@$9.50; horseshoes, $19@$19.50; axles, $26; cast machinery, $12; stove plates, $9.50@$10; borings, $8@$8.50; wrought turnings, $13.50; No. 1 railroad shop or forge, $21.50; track scrap, $19.

**Old Wheels and Rails.**—The supply of old iron rails is being rapidly exhausted, and their withdrawal from the market has drawn out a number of offers withheld when they were for sale; this is probably the most sensitive material in the market. Five hundred tons have been sold at $23. Steel rails are $14.50@$16.50, and old wheels are now about $18.

### Louisville. Jan. 10.

(Special Report by Hall Bros. & Co.)

The iron market still continues quiet, and very low prices are ruling. Some inquiries for moderate sized lots are being made, resulting in some sales of both coke and charcoal irons, though no transactions of moment have been noted. A large number of Southern furnaces are closed on account of the miners' strike. Consumers appear to be well supplied to cover immediate wants, and are refraining from making any large purchases for the future.

**Hot Blast Foundry Irons.**—Southern coke, No. 1, $14.25@$14.50; No. 2, $13.75@$14; No. 3, $13.25@$13.50. Southern charcoal, No. 1, $16.50@$17; No. 2, $16@$16.50. Missouri charcoal, No 1, $17.50@$18; No. 2, $17@$17.50.

**Forge Irons.**—Neutral coke, $12.50@$13; cold short, $12.50@$13; mottled, $12@$12.25.

**Car Wheel and Malleable Irons.**—Southern, standard brands, $21@$22; other brands, $17.50 @$18. Lake Superior, $21.50@$22.50.

**Philadelphia.** Jan. 15.
(From our Special Correspondent.)

**Pig Iron.**—Sales of foundry are more numerous and in larger quantities, but the bulk of recent sales has been of inferior, rather than of standard makes. The low figures gave rise to fresh rumors about a decline in prices. Standard No. 1 cannot be had very easily under $18, but iron that meets all No. 1 requirements is going at $17.50. No Southern foundry is selling, but contracts are being placed for forge. Stocks are light. Mill brands are delivered as usual at $14.50@$15. An improving feeling is manifest, but conservative management controls yet in all directions.

**Foreign Material.**—Spiegel ranges from $29.50 @$31.50, according to make.

**Steel Billets.**—Quotations $28, sales at $27.50. Several large lots will be taken in a few days.

**Muck Bars.**—Sales have been made of round lots at $27@$27.50.

**Merchant Iron.**—Large lots of refined have been contracted for at $1.80; medium, $1.75; small mill lots, $1.85; for best and store, $1.90@$1.95. Business does not accumulate fast, and prices are low, as so many mills are in need of business.

**Skelp.**—Grooved skelp is active at $1.85, though a trifle less has been taken on a large order.

**Wrought Iron Pipe.**—To-day's meeting in the opinion of some of the trade ought to result in higher prices, because of the very active demand for pipes, especially small sizes. The outlook is excellent for a busy winter and spring trade.

**Sheet Iron.**—Business has not yet started up.

**Plate and Tank.**—Considerable new business is offered, but not much is closed as buyers insist on terms that manufacturers regard as too low altogether. Ship plate and tank iron is quoted at $2, but less may be taken to-day; bridge plate is $2@$2.15 for iron, and engineers and draughtsmen are very busy on new work.

**Structural Iron.**—New work is slow. Quotations for angles, $2.10; plates, $2.15; tees, $2.60; beams, $3.10.

**Steel Rails.**—The leak has been stopped up, and rail prices will be better. To-day's bottom quotations are $28, but some conditional offers are out which may enable buyers to get in at $27.50.

**Old Rails.**—Seaboard quotation, $24.

**Scrap.**—Buyers are offering $21 for railroad.

**Pittsburg.** Jan. 15.
(From our Special Correspondent.)

**Raw Iron and Steel.**—The market has shown no particular change during the week, dullness being the rule. The iron, coke and ore trade continues in such unsettled condition that the future outlook is very dark. The closing down of the valley furnaces on the 10th is now a matter of history. Many people insisted that that annouucement was only a bluff on the part of furnace owners, but instead of that it was a case of necessity. The only furnaces now running are those which have unfilled contracts on hand. When these are completed the shut-down will become general. The number of men thrown out of employment by the action of the furnace owners is about 12,000, which, of course, is extremely unfortunate, happening in the middle of winter.

The coke men are very conservative, and have nothing to say, regarding the future; they have made a reduction, and it is now in order for the railroads to make a similar movement. One thing is evident, there must be some change before we can look for a revival of the iron trade. A leading dealer says: "Some business is being done, but the aggregate is not of much importance and in some branches competion is becoming very close. The entire business is going through a process of readjustment, and until that is completed it is useless to look for improvement. A readjustment of cost has to be made as well as a readjustment of production, and these matters require time." They are gradually being worked out, however, by securing reductions in the cost of material and labor. No sales can be forced, for the next thirty days without breaking prices still further. Hence, for the present, the tendency is to let things drift along until the effect of the curtailment in production becomes more marked.

The limited sales reported show a wide range in prices. There have been sales of city furnace Bessemer, January, February, at $16.50 cash; grades not so well known range from $15.75@$16, and the same applies to gray forge; steel blooms and billets maintain last week's prices, but demand is limited; muck bar is steady, but not very active, holders generally refusing to make further concessions; ferro-manganese prices are still on the down grade; steel wire rods sold at a decline from last week's prices; spiegel prices are maintained; skelp iron, narrow and wide grooved, are lower than last week; sheared iron prices were maintained; scrap material dull and market weaker; old iron and steel rails are dull, with reports of sales below last week's prices; new steel rails, the demand continues very light and prices nominal.

*Coke Smelted Lake and Native Ores.*

3,000 Tons Bessemer, Jan., Feb., March, April.$16.25 cash.
3,000 Tons Bessemer City Furnace, Jan., Feb. 16.50 cash.
1,500 Tons Bessemer, Feb., March, April..... 16.00 cash.
1,000 Tons Bessemer..... 16.25 cash.
1,000 Tons Grey Forge at City Furnace..... 14.50 cash.
1,000 Tons Grey Forge..... 14.50 cash.
1,000 Tons Grey Forge..... 14.25 cash.
800 Tons Grey Forge..... 14.25 cash.
200 Tons Grey Forge..... 14.50 cash.
100 Tons No. 3 Foundry..... 15.00 cash.
100 Tons No. 2 Foundry..... 15.75 cash.
100 Tons No. 1 Foundry..... 16.75 cash.
150 Tons Silvery..... 16.50 cash.

*Charcoal.*

75 Tons Cold Blast..... 28.00 cash.
50 Tons Cold Blast..... 26.00 cash.
175 Tons No. 2 Foundry..... 22.50 cash.

*Steel Slabs and Billets.*

1,500 Tons Billets and slabs, Jan., Feb..... 25.00 cash.
500 Tons Billets, Jan., Feb..... 25.00 cash.
500 Tons Billets, Jan..... 25.00 cash.

*Muck Bar.*

1,000 Tons Neutral, Jan., Feb..... 28.50 cash.
500 Tons Neutral, Jan., Feb..... 28.75 cash.
500 Tons Neutral, Feb., March..... 28.00 cash.

*Steel Wire Rods.*

700 Tons American fives, Feb., March..... 36.50 cash.

*Ferro-Manganese.*

50 Tons 80% Jersey City..... 60.25 cash.

*Steel Bloom Ends.*

600 Tons Bloom Ends..... 16 50 cash.

*Skelp Iron.*

210 Tons Sheared Iron..... 2.00 4 m.
100 Tons Wide Grooved..... 1.90 4 m.
75 Tons Narrow Grooved..... 1.85 4 m.

*Old Iron and Steel Rails.*

500 Tons American T's..... 24.50 cash.
500 Tons American T's..... 24 25 cash.

*Old Scrap Material.*

1,000 Tons No. 1 Wrought Scrap, net..... 20.00 cash.
300 Tons Cash Scrap, gross..... 14 50 cash.
100 Tons Car Wheels, gross..... 18.00 cash.
100 Tons Iron Axles, Extra, net..... 32.00 cash.

## CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Jan. 16.

The business for the past week is reported as fair; no decided change, but an increased demand is noted, and the general tone may be said to have increased in firmness. Almost all arrivals, with few exceptions, have been on contract, and as a consequence, stocks available for spot delivery remain small; of some grades the market is almost bare. Dealers speak encouragingly of the outlook for future business. The apathy that was noticeable during the first week of the year seems disappearing. The fire on the North River burned up a large amount of sal soda, so that stock has been considerably decreased. Continual arrivals keep the demand well supplied however, and no difference has been made in the price.

Caustic soda, 60%.—Arrivals are reported fairly heavy and trade to correspond. There is very little imported excepting on orders, prices range from 3·35 to 3·37½c. for spot, shipments ahead a little lower; 70 to 74%. Arrivals on contract of about 1,500 drums have been reported. Small stocks remain available and some traders report business as dull. Sales have been made at 3·12c. for 60 and quoted prices are 3·10@3·15c. The market for 77% remains inactive, no business of any consequence doing and small stock available for spot delivery. Values have been the same throughout the week, 3·10c.

Carbonated soda ash, 48 per cent.—Some arrivals on contract are said to have been made; prices vary slightly as to time; 1.57½c. is quoted; 58 per cent. Alkali for shipment ranges from 1.56¼ to 1.57½c.; some slight demand, with arrivals on contract, and small available stock, are the most prominent features of the market.

Caustic soda ash, 48%.—Rules about 2½ less than carbonated. Little is reported available, and a correspondingly small demand is noted. Consumption continues as heretofore but has not made itself felt in the market.

Sal soda is arriving in fair quantities countinually. Most of it is brought to sell on regular importations. Very little is doing; values remain the same at 1·10c. for spot. Futures are selling a little lower. The fire is said to have consumed large quantities.

Bleaching powder.—Small sales are reported with a slight advance in price noted. Sellers a little firmer, holding at from 1·70c.@1·75c.

**Acids.**—Regular contracting for the year may be said to have been completed, and reports with a few exceptions are favorable. Some dealers report a large increase in business while others continue to hold their share of it, and still a third class are not so well satisfied. It is generally understood in the trade that the members of the "Combine" belong to this last subdivision. The impression prevails that they find the bed they have made a pretty hard one to lie on, and the realization of this fact affords many traders no small amount of satisfaction. Prices continue low with no prospect of advancement, and competition so sharp that slight differences in distance to point of delivery are sufficient to swallow whatever margin there is in the business.

We quote acids per hundred pounds in New York and vicinity: Acetic, $1.65@$2.20; muratic, 18°, 80c. @$1; muriatic 20°, 90c.@$1.10; muriatic, 22°, $1@ $1.20; nitric, 40°, $3.25@$3.50; nitric 42°, $3.50@$4; sulphuric, 60°, 70c.@80c.; sulphuric, 66°, 75c.@90c.

**Fertilizing Chemicals.**—No great change is noticeable since our last. Some business is reported, but nothing that has had any effect on prices. The local demand here for fertilizers is small, but reports from the South, where most of the business is being done at present, are favorable. With the approaching spring a good business is looked forward to.

Rather large arrivals of sulphate of ammonia have come in, somewhat over 100 tons, and as a consequence the market is a little weaker. Gas liquor is selling at 3·15c., and bone is reported at from 2½ to 5 less, 3·10@3·12½c. Foreign stock spot is held at 3·15c. A greater demand is looked forward to in this line.

The market for phosphate rock continues as heretofore, demand has not yet made itself decidedly felt, and prices are as quoted in our last: Dried Charleston rock, $7@$7.50 f. o. b. vessel; Charleston rock, ground, $8@$11.50.

Muriate of Potash.—The spot supply is reported small and some inquiry at current prices is noticeable. Arrivals during the week have been large for this time of the year, about 1,000 tons almost all of which went into consumption. The cold in Europe is at last making itself felt in the price here. Owing to ice on the Elbe, shipments have to be made by rail, which will cause an additional expense of 5c. per cwt. until navigation is resumed. Not much is reported on the way. Prices are $1.82½ for New York, $1.85 for Philadelphia; $1.87½ for Southern ports, and $1.90 for Gulf ports.

Nitrate of Soda.—Prices have grown firmer since our last issue, and with more definite information from Chili values are increasing. Advices from London and Peru mention the impending blockade of Iquique, and leave one to infer that the revolution is of a more serious nature than was at first supposed. We quote $1 75@$1.80 for spot and $1.75@$1.80 for lots now due. No dealing is done in futures, as dealers are afraid and waiting further developments. The stock here is reported as quite large, 35,000 bags, but the probability of an advance seems reasonable under the circumstances.

Brimstone.—No change is reported in this article. Some large arrivals have come in but prices are nearly, if not quite, as quoted in our last. Shipments to arrive are scarce. January and February steam shipments are held at $26. December, $26.50; this is for best unmixed seconds; thirds are from 50 to 75c. less. The tone of the market is not quite as firm as heretofore. Some dealers look forward to a decline.

NOTES OF THE WEEK.

In our issue of last week we mentioned the newly-incorporated Nichols Chemical Company, and although at the time Mr. W. H. Nichols disclaimed all connection of his firm with the former, we have now to report that papers were signed on Thursday by which they become one and the same concern. The officers of the new corporation are: Mr. W. H. Nichols, president; Mr. J. B. F. Herreshoff, vice-president; Mr. Edward R. Nichols, treasurer, and Mr. George Martin Luther, of Brooklyn, secretary. Capital, $2,000,000 in 20,000 shares. The management will be the same as of the old co-partnership and no change of policy is contemplated. The size of the business had become too large to be managed comfortably by the old firm and they acquire thus the advantages conceeded by law to an incorporation. This firm has long been conspicuous for the wise and far-seeing liberality of its management. Under some of the most prominent business and professional ability it has grown to its present dimensions and starts now with the best wishes of a host of friends for further success. We understand that for some months the firm had entirely discontinued the practice of making matte, and it is the present intention to continue the production of copper in the form of sulphate only.

The failure of James Chaskel, proprietor of the Chaskel Chemical Works, doing business under the style of James Chaskel & Co., manufacturer of essential oils, flavoring extracts, etc., at No. 177 Pearl street, was a surprise to the trade. It is thought that the liabilities will amount to about $70,000. Real estate, stock in trade, probably worth $20,000, and outstanding accounts are the assets. The failure is said to have been due to tight money.

## BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Jan. 16.

A better tone pervades the market, and dealers look to somewhat increased activity. Some inquiry has been made for different grades of brick, but one of the great difficulties is the scarcity of ready money which still makes itself felt in building circles. Traders do not like to make time sales if they can help it, and now they do not make them at all. Some large orders are at present going begging for that very reason. But the aggregate sales of brick for the past week are very small. Keyport and Jersey are just commencing to ship; very small quantities were reported available before. An increased demand for pale brick has made itself felt, so that they are now held a little higher. We quote:

Haverstraws, $5.75@$6.25 per M.; Hackensacks, $5.50@$5.75; Jerseys, $4.50@$5, and pale brick is held at from $3.25 to $3.50.

**Lime.**—Dealers speak rather confidently of this market. Prices continue very firm, and if the weather keeps on as at present a rise is expected. The supply here is small, not more than 1,500 pounds probably. Nothing is expected and nothing is being made. Values are stiff at 90c.@$1.10 for common and finishing Rockland lime. St. John common and finishing 85@90c. Glen Falls, common and finishing, 90c.@$1.10.

## DIVIDEND-PAYING MINES.

| | Name and Location of Company. | Capital Stock. | Shares. No. | Shares. Par | Assessments. Total levied. | Assessments. Date and Amount of last | | | Dividends. Total paid. | Dividends. Date & amount of last. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Adams, S. L. | Colo. | $1,500,000 | $10 | * | | | | $555,000 | Jan. | 1887 | .10 |
| 2 | Alice, S. C. | Mont. | 10,000,000 | 400,000 | 25 | * | | | | 395,000 | Dec. | 1890 | .05 |
| 3 | Alma&Nel Wood C., G. | Idaho | 300,000 | 30,000 | 10 | * | | | | 60,000 | Jan. | 1889 | .50 |
| 4 | American & Nettie, C. | Colo. | | 300,000 | | | | | | 150,000 | Nov. | 1889 | .10 |
| 5 | Amy & Silversmith, S. | Mont. | | 341,419 | | | | | | 247,530 | Aug. | 1887 | .12½ |
| 6 | Atlantic, C. | Mich. | 1,000,000 | 40,000 | 25 | $280,000 | April | 1875 | $1.00 | 660,000 | Aug. | 1890 | 1.00 |
| 7 | Argenta, S. | Nev. | 10,000,000 | 100,000 | 100 | 335,000 | July | 1889 | .10 | 40,000 | Feb. | 1890 | .20 |
| 8 | Aspen Mg. & S., S. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | | 560,000 | Dec. | 1890 | .10 |
| 9 | Aurora, I. | Mich. | 2,000,000 | 100,000 | 20 | | | | | 155,000 | Oct. | 1887 | 1.87½ |
| 10 | Badger, S. | Ont. | 250,000 | 50,000 | 5 | | | | | 37,500 | Mar. | 1890 | .25 |
| 11 | Bassick, G. S. | Colo. | 10,000,000 | 100,000 | 100 | * | | | | 400,000 | Mar. | 1884 | 1.00 |
| 12 | Belle Isle, S. | Nev. | 10,000,000 | 100,000 | 100 | 190,000 | Dec. | 1889 | .15 | 300,000 | Dec. | 1879 | .25 |
| 13 | Belcher, G. S. | Nev. | 10,400,000 | 104,000 | 100 | 2,978,000 | June | 1890 | .50 | 15,397,000 | April | 1876 | 1.00 |
| 14 | Bellevue, Idaho, S. L. | Idaho | 1,250,000 | 125,000 | 10 | 120,000 | Dec. | 1889 | .25 | 200,000 | Jan. | 1887 | .10 |
| 15 | Bi-Metallic, S. | Mont. | 5,000,000 | 200,000 | 25 | | | | | 270,000 | Nov. | 1890 | .35 |
| 16 | Bodie Con., G. S. | Cal. | 10,000,000 | 100,000 | 100 | 580,000 | June | 1890 | .25 | 1,602,572 | April | 1885 | .50 |
| 17 | Boston & Mont., G. | Mont. | 2,500,000 | 250,000 | 10 | * | | | | 520,000 | June | 1886 | 1.50 |
| 18 | Boston & Mont., C. S. | Mont. | 2,500,000 | 100,000 | 25 | * | | | | 1,575,000 | Nov. | 1890 | 1.50 |
| 19 | Breece, S. | Colo. | 5,000,000 | 200,000 | 25 | * | | | | 2,000 | Feb. | 1880 | .01 |
| 20 | Brooklyn Lead, L. S. | Utah | 500,000 | 50,000 | 10 | | | | | 127,000 | July | 1887 | .05 |
| 21 | Bulwer, G. | Cal. | 10,000,000 | 100,000 | 10 | 130,000 | Aug. | 1889 | .25 | 175,000 | Jan. | 1884 | .10 |
| 22 | Bunker Hill & Sull. | Idaho | 3,000,000 | 300,000 | 10 | * | | | | 150,000 | Oct. | 1883 | .06⅔ |
| 23 | Caledonia, G. | Dak. | 10,000,000 | 100,000 | 100 | 505,000 | May | 1885 | .15 | 184,000 | Oct. | 1890 | .06 |
| 24 | Calliope, S. | Colo. | 1,000,000 | 1,000,000 | | | | | | 135,000 | Dec. | 1890 | .00½ |
| 25 | Calumet & Hecla, C. | Mich. | 2,000,000 | 100,000 | 25 | 1,200,000 | | | | 34,350,000 | May | 1890 | 5.00 |
| 26 | Carbonate Hill, S. L. | Colo. | 1,500,000 | 200,000 | 10 | * | | | | 80,000 | April | 1884 | .05 |
| 27 | Carlisle, G. | N. M. | 1,000,000 | 200,000 | 5 | | | | | 175,000 | Dec. | 1888 | .12½ |
| 28 | Castle Creek, G. | Idaho | 100,000 | 100,000 | 1 | | | | | 51,000 | Oct. | 1883 | .03 |
| 29 | Catalpa, S. L. | Colo. | 3,000,000 | 300,000 | 10 | * | | | | 270,000 | May | 1884 | .10 |
| 30 | Central, C. | Mich. | 500,000 | 20,000 | 25 | 100,00 | Oct. | 1861 | .65 | 1,950,000 | Feb. | 1890 | 1.00 |
| 31 | Chrysolite, S. L. | Colo. | 10,000,000 | 200,000 | 50 | * | | | | 1,650,000 | Dec. | 1884 | .25 |
| 32 | Colorado Central, S. L. | Colo. | 2,750,000 | 275,000 | 10 | * | | | | 406,250 | Aug. | 1889 | .05 |
| 33 | Commonwealth, S. | Nev. | 10,000,000 | 100,000 | 100 | 170,000 | Nov. | 1888 | .50 | 20,000 | Nov. | 1890 | .20 |
| 34 | Confidence, S. L. | Nev. | | 24,386 | | 32,500 | May | 1890 | .75 | 199,686 | April | 1889 | 1.00 |
| 35 | Cons. Cal. & Va., G. S. | Nev. | 21,600,000 | 216,000 | 100 | 1,800 | Jan. | 1885 | .20 | 3,466,800 | April | 1890 | .25 |
| 36 | Contention, S. | Ariz. | 12,500,000 | 250,000 | 50 | | | | | 12,500,000 | Dec. | 1884 | .25 |
| 37 | **Cop. Queen Con., C. | Ariz. | 1,400,000 | 140,000 | 10 | | | | | 210,000 | Feb. | 1889 | .50 |
| 38 | Crescent, S. L. G. | Utah | 15,000,000 | 600,000 | 25 | * | | | | 228,000 | Oct. | 1888 | .03 |
| 39 | Crown Point, G. S. | Nev. | 16,000,000 | 100,000 | 100 | 2,425,000 | Sept. | 1889 | .50 | 11,588,000 | Jan. | 1875 | 2.00 |
| 40 | Daly, S. L. | Utah | 3,000,000 | 150,000 | 20 | | | | | 1,762,500 | Dec. | 1890 | .25 |
| 41 | Deer Creek, S. G. | Idaho | 1,000,000 | 200,000 | 5 | * | | | | 20,000 | June | 1889 | .05 |
| 42 | Deadwood-Terra, G. | Dak. | 2,500,000 | 100,000 | 25 | * | | | | 61,000,000 | Nov. | 1887 | .10 |
| 43 | Derbec B. Grav., G. S. | Cal. | 10,000,000 | 100,000 | 100 | 90,000 | Dec. | 1881 | .10 | 240,300 | Oct. | 1890 | .10 |
| 44 | Dunkin, S. L. | Colo. | 5,000,000 | 200,000 | 25 | * | | | | 390,000 | Oct. | 1889 | .05 |
| 45 | Dunstone, G. S. L. | Mont. | 1,000,000 | 200,000 | 5 | * | | | | 6,000 | Nov. | 1888 | .03 |
| 46 | Eclipse | Colo. | 100,000 | 100,000 | 1 | | | | | 20,000 | Nov. | 1887 | .10 |
| 47 | Elkhorn, G. S. | Mont. | 1,000,000 | 200,000 | 5 | * | | | | 196,875 | Dec. | 1890 | .50 |
| 48 | Empire Lt., G. | Mont. | 500,000 | 100,000 | 5 | | | | | 70,500 | Oct. | 1887 | .37½ |
| 49 | Eureka Con., G. S. L. | Nev. | 5,000,000 | 50,000 | 100 | 550,000 | June | 1889 | .50 | 4,892,500 | Oct. | 1890 | .25 |
| 50 | Evening Star, S. L. | Colo. | 500,000 | 50,000 | 10 | * | | | | 1,458,000 | Dec. | 1889 | .25 |
| 51 | Excelsior, G. | Cal. | 10,000,000 | 100,000 | 100 | 563,000 | Sept. | 1885 | 1.00 | 875,000 | Oct. | 1890 | .25 |
| 52 | Father de Smet, G. | Dak. | 10,300,000 | 100,000 | 100 | 280,000 | Nov. | 1878 | 1.00 | 1,125,000 | Dec. | 1885 | .20 |
| 53 | Franklin, C. | Mich. | 1,000,000 | 40,000 | 25 | 220,000 | June | 1871 | | 960,000 | Jan. | 1889 | 2.00 |
| 54 | Freeland, G. S. C. | Colo. | 5,000,000 | 200,000 | 25 | * | | | | 190,000 | July | 1886 | .10 |
| 55 | Garfield Lt., G. | Nev. | 500,000 | 100,000 | 5 | | | | | 95,000 | April | 1888 | .12½ |
| 56 | Gould & Curry, G. S. | Nev. | 10,800,000 | 108,000 | 100 | 3,988,800 | Sept. | 1890 | .25 | 2,826,000 | Oct. | 1870 | 10.00 |
| 57 | Grand Prize, S. | Nev. | 10,000,000 | 100,000 | 100 | 785,000 | Jan. | 1890 | .30 | 525,000 | Jan. | 1890 | .30 |
| 58 | Granite, S. L. | Idaho | 500,000 | 500,000 | 1 | * | | | | 28,400 | Oct. | 1889 | .02 |
| 59 | Granite Mountain, S. | Mont. | 10,000,000 | 400,000 | 25 | | | | | 10,200,000 | Dec. | 1890 | .50 |
| 60 | Green Mountain, G. | Cal. | 1,250,000 | 125,000 | 10 | | | | | 212,000 | Nov. | 1881 | .07½ |
| 61 | Hale & Norcross, G. S. | Nev. | 11,200,000 | 112,000 | 100 | 5,142,800 | April | 1890 | .50 | 1,162,500 | July | 1888 | .50 |
| 62 | Hecla Con., S. G. L. C. | Mont. | 1,500,000 | 30,000 | 50 | | | | | 1,500,000 | April | 1889 | .50 |
| 63 | Hel'a Mg. & Red, G. S. L. | Mont. | 8,315,000 | 663,000 | 5 | * | | | | 197,979 | July | 1886 | .06 |
| 64 | Holmes, S. | Nev. | 10,000,000 | 100,000 | 100 | 370,000 | May | 1890 | .25 | 75,000 | April | 1886 | .25 |
| 65 | Holyoke, G. | Idaho | 200,000 | 200,000 | 1 | | | | | 27,000 | Feb. | 1883 | .10 |
| 66 | Homestake, G. | Dak. | 12,500,000 | 125,000 | 100 | 300,000 | July | 1878 | 1.00 | 5,631,250 | Dec. | 1890 | .10 |
| 67 | Honorine, S. L. | Utah | 500,000 | 250,000 | 2 | 37,500 | April | 1889 | .05 | 125,000 | Sept. | 1887 | .05 |
| 68 | Hope, S. | Mont. | 1,000,000 | 100,000 | 10 | * | | | | 233,252 | April | 1888 | .25 |
| 69 | Horn-Silver, S. L. | Utah | 10,000,000 | 400,000 | 25 | * | | | | 4,150,000 | June | 1890 | .12½ |
| 70 | Hubert, G. | Colo. | 1,000,000 | 1,000,000 | 1 | * | | | | 247,000 | Dec. | 1889 | .00½ |
| 71 | Idaho, G. | Cal. | 310,000 | 3,100 | 100 | | | | | 5,235,900 | Dec. | 1889 | 5.00 |
| 72 | Ideal, S. L. | Colo. | 1,500,000 | 50,000 | 10 | | | | | 15,000 | Oct. | 1886 | .05 |
| 73 | Illinois, S. | N. M. | 100,000 | 100,000 | 1 | * | | | | 45,000 | April | 1889 | .20 |
| 74 | Independence, S. | Nev. | 10,000,000 | 100,000 | 100 | 340,000 | Oct. | 1886 | .30 | 225,000 | Sept. | 1879 | .25 |
| 75 | Iron Hill, S. | Dak. | 2,500,000 | 250,000 | 10 | 134,000 | July | 1889 | .03 | 156,250 | Nov. | 1887 | .07½ |
| 76 | Iron-Silver, S. L. | Colo. | 10,000,000 | 500,000 | 20 | * | | | | 2,500,000 | April | 1889 | .20 |
| 77 | Jackson, G. S. | Nev. | 5,000,000 | 50,000 | 100 | 237,500 | Nov. | 1880 | .20 | 55,000 | June | 1889 | .10 |
| 78 | Jay Gould. | Mont. | 2,000,000 | 40,000 | 5 | * | | | | 459,000 | May | 1890 | .04 |
| 79 | Jocuistita, L. | Mex. | 2,500,000 | 250,000 | 10 | | | | | 1,200,000 | Feb. | 1885 | .50 |
| 80 | Jumbo, G. | Colo. | 2,000,000 | 200,000 | 10 | | | | | 35,000 | Oct. | 1887 | .02½ |
| 81 | Kearsarge, C. | Mich. | 1,250,000 | 50,000 | 25 | 190,000 | Oct. | 1887 | 1.00 | 100,000 | Jan. | 1890 | 2.00 |
| 82 | Kentuck, S. | Nev. | 3,000,000 | 30,000 | 100 | 406,980 | Aug. | 1890 | .30 | 1,350,000 | Dec. | 1886 | .10 |
| 83 | La Platta, S. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | | 610,000 | Sept. | 1882 | .30 |
| 84 | Leadville Con., S. L. L. | Colo. | 4,000,000 | 400,000 | 10 | * | | | | 4,423,000 | April | 1889 | .05 |
| 85 | Lexington, G. S. | Mont. | 4,000,000 | 40,000 | 100 | * | | | | 609,000 | Jan. | 1885 | 2.00 |
| 86 | Little Chief, S. L. | Colo. | 10,000,000 | 200,000 | 50 | * | | | | 820,000 | Dec. | 1890 | .05 |
| 87 | Little Pittsburg, S. L. | Colo. | 20,000,000 | 200,000 | 100 | * | | | | 1,050,000 | Mar. | 1890 | .50 |
| 88 | Little Rule | Colo. | 500,000 | 500,000 | 1 | | | | | 100,000 | Dec. | 1890 | .02 |
| 89 | Mammoth | Utah | 10,000,000 | 400,000 | 25 | 110,000 | | 1882 | .25 | 760,000 | Jan. | 1890 | .10 |
| 90 | Martin White, S. | Nev. | 10,000,000 | 100,000 | 100 | 1,225,000 | Oct. | 1890 | .25 | 140,000 | Dec. | 1886 | .25 |
| 91 | Mary Murphy, G. S. | Colo. | 350,000 | 3,500 | 100 | * | | | | 175,000 | May | 1888 | 5.00 |
| 92 | Matchless, S. | Colo. | 500,000 | 500,000 | 1 | | | | | 15,000 | Feb. | 1890 | .00½ |
| 93 | May Mazeppa | Colo. | 1,000,000 | 100,000 | 10 | | | | | 60,000 | Dec. | 1890 | .01 |
| 94 | Minnesotta, C. | Mich. | 1,000,000 | 40,000 | 25 | 420,000 | April | 1886 | 1.00 | 1,820,000 | --- | 1876 | |
| 95 | Mono, G. | Cal. | 5,000,000 | 50,000 | 100 | 760,000 | Sept. | 1890 | .25 | 12,500 | ---iar | 1886 | .25 |
| 96 | Montana, Lt., G. S. | Mont. | 3,300,000 | 660,000 | 5 | * | | | | 2,489,675 | ---ct | 1890 | .06 |
| 97 | Morning Star, S. L. | Colo. | 1,000,000 | 100,000 | 10 | | | | | 850,000 | ---ec | 1889 | .30 |
| 98 | Moulton, S. G. | Mont. | 2,000,000 | 400,000 | 5 | * | | | | 380,000 | ---ec | 1887 | .07½ |
| 99 | Mount Pleasant, G. | Cal. | 150,000 | 150,000 | 1 | * | | | | 150,000 | eb. | 1887 | .30 |
| 100 | Mt. Diablo, S. | Nev. | 5,000,000 | 50,000 | 100 | 137,500 | June | 1880 | 2.00 | 160,000 | ---t | 1889 | .20 |
| 101 | Napa, Q. | Cal. | 700,000 | 100,000 | 7 | | | | | 400,000 | Jan. | 1891 | .10 |
| 102 | Navajo, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 500,000 | April | 1890 | .15 | 365,000 | April | 1889 | .10 |
| 103 | New Guston, S. | Colo. | 500,000 | 100,000 | 5 | * | | | | 337,500 | April | 1890 | .50 |
| 104 | N. Hoover Hill, G. S. | N. C. | 330,000 | 120,000 | 2½ | * | | | | 30,000 | Dec. | 1885 | .06⅔ |
| 105 | Northern Belle, S. | Nev. | 5,000,000 | 50,000 | 100 | 425,000 | Jan. | 1884 | 8.00 | 2,400,000 | April | 1883 | .50 |
| 106 | North Belle Isle, S. | Nev. | 10,000,000 | 100,000 | 100 | 395,000 | April | 1890 | .20 | 230,000 | May | 1883 | .50 |
| 107 | North Star, G. | Cal. | 1,000,000 | 100,000 | 10 | | | | | 250,000 | Dec. | 1889 | .50 |
| 108 | Ontario, S. L. | Utah | 15,000,000 | 150,000 | 100 | | | | | 11,525,000 | Dec. | 1890 | .50 |
| 109 | Ophir, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 4,210,640 | April | 1890 | .50 | 1,595,800 | July | 1882 | 1.00 |
| 110 | Original, S. C. | Mont. | 1,500,000 | 60,000 | 25 | * | | | | 123,000 | July | 1888 | .05 |
| 111 | Oro | Colo. | 500,000 | 100,000 | 5 | | | | | 60,000 | June | 1890 | .20 |
| 112 | Osceola, C. | Mich. | 1,250,000 | 50,000 | 25 | 480,000 | April | 1876 | 1.60 | 1,447,500 | Dec. | 1890 | 1.50 |
| 113 | Oxford, G. S. | N. S. | 125,000 | 125,000 | 1 | * | | | | 78,500 | Sept. | 1883 | .02 |
| 114 | Paradise Valley, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 57,000 | April | 1888 | .15 | 150,000 | April | 1887 | .10 |
| 115 | Parrot, C. | Mont. | 1,800,000 | 180,000 | 10 | | | | | 696,000 | Sept. | 1890 | .10 |
| 116 | Peacock, S. G. C. | N. M. | 2,000,000 | 200,000 | 10 | * | | | | 60,000 | Nov. | 1886 | |
| 117 | Plumas Eureka, G. | Cal. | 1,406,250 | 140,625 | 10 | | | | | 2,548,046 | Oct. | 1889 | .37½ |
| 118 | Plutus, G. S. C. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | | 20,000 | Feb. | 1886 | .10 |
| 119 | Plymouth Con., G. | Cal. | 5,000,000 | 100,000 | 50 | * | | | | 2,220,000 | Dec. | 1890 | .40 |
| 120 | Quicksilver, pref., Q. | Cal. | 4,300,000 | 43,000 | 100 | | | | | 1,705,791 | Aug. | 1890 | 1.50 |
| 121 | " com., Q. | Cal. | 5,700,000 | 57,000 | 100 | | | | | 643,867 | July | 1882 | .40 |
| 122 | Quincy, C. | Mich. | 1,000,000 | 40,000 | 25 | 200,000 | Dec. | 1862 | | 5,570,000 | Aug. | 1890 | 5.00 |
| 123 | Republic, C. | Mich. | 5,000,000 | 100,000 | 50 | 400,000 | Dec. | 1889 | .30 | 4,312,587 | June | 1887 | 1.25 |
| 124 | Richmond, S. L. | Nev. | 1,350,000 | 54,000 | 25 | * | | | | 99,785 | Feb. | 1880 | .50 |
| 125 | Ridge, C. | Mich. | 500,000 | 20,000 | 25 | 219,939 | Mar. | 1886 | .50 | 595,000 | Mar. | 1886 | .05 |
| 126 | Robinson Con., S. L. | Colo. | 10,000,000 | 200,000 | 50 | * | | | | 100,000 | Dec. | 1889 | .50 |
| 127 | Robert E. Lee, S. L. | Colo. | 10,000,000 | 500,000 | 20 | | | | | 4,460,000 | July | 1869 | 3.00 |
| 128 | Savage, S. | Nev. | 11,200,000 | 112,000 | 100 | 6,604,000 | Nov. | 1889 | .50 | 7,500 | April | 1883 | .01 |
| 129 | Snosnone, G. | Idaho | 150,000 | 150,000 | 1 | | | | | 1,568,145 | April | 1888 | .12½ |
| 130 | Sierra Buttes, G. | Cal. | 2,225,000 | 122,500 | 10 | | | | | 102,000 | Jan. | 1871 | 1.00 |
| 131 | Sierra Nevada, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 6,296,910 | May | 1890 | .50 | 270,000 | April | 1889 | .10 |
| 132 | Sierra Nevada, S. L. | Idaho | 1,000,000 | 1,000,000 | 1 | * | | | | 40,000 | May | 1889 | .02 |
| 133 | Silver Cord, G. S. L. | Colo. | 4,500,000 | 450,000 | 10 | | | | | 270,000 | April | 1889 | .10 |
| 134 | Silver King, S. | Ariz. | 10,000,000 | 100,000 | 100 | 130,000 | Nov. | 1890 | .30 | 1,950,000 | July | 1887 | .25 |
| 135 | Silver Mg. of L. V. | N. M. | 500,000 | 500,000 | 1 | | | | | 275,000 | Dec. | 1890 | .05 |
| 136 | Silverton, G. S. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | | 50,000 | Jan. | 1881 | .25 |
| 137 | Small Hopes Con., S. | Colo. | 5,000,000 | 250,000 | 20 | * | | | | 3,162,500 | Oct. | 1890 | .10 |
| 138 | Spring Valley, G. | Cal. | 300,000 | 300,000 | 1 | 50,000 | Oct. | 1886 | .25 | 3,595,000 | June | 1888 | .05 |
| 139 | Standard, G. S. | Cal. | 10,000,000 | 100,000 | 100 | 150,000 | June | 1890 | .50 | 155,000 | Nov | 1881 | .05 |
| 140 | Stormont, S. | Utah | 500,000 | 500,000 | 1 | * | | | | 844,000 | Dec. | 1887 | .20 |
| 141 | St. Joseph, L. | Mo. | 1,500,000 | 150,000 | 10 | * | | | | 9,000 | April | 1888 | .02½ |
| 142 | Swansea, G. | Colo. | 600,000 | 60,000 | 10 | * | | | | 100,000 | Nov | 1881 | .20 |
| 143 | Tamarack, C. | Mich. | 1,000,000 | 40,000 | 25 | 520,000 | April | 1885 | 3.00 | 1,670,000 | Oct. | 1890 | 4.00 |
| 144 | Tombstone, G. S. L. | Ariz. | 12,500,000 | 500,000 | 25 | * | | | | 1,250,000 | April | 1882 | .10 |
| 145 | United Verde, C. | Ariz. | 3,000,000 | 300,000 | 10 | * | | | | 97,500 | Feb. | 1884 | .05 |
| 146 | Valencia, M. | N. M. | 150,000 | 1,500 | 100 | * | | | | 41,250 | April | 1886 | 2.50 |
| 147 | Viola Lt., S. L. | Idaho | 750,000 | 150,000 | 5 | | | | | 272,500 | Oct. | 1887 | .37½ |
| 148 | Ward Con., S. L. | Colo. | 2,000,000 | 200,000 | 10 | | | | | 20,000 | Dec. | 1889 | .05 |
| 149 | Yankee Girl | Colo. | 2,500,000 | 250,000 | 10 | | | | | 1,275,000 | July | 1887 | .10 |
| 150 | Yellow Jacket, G. S. | Nev. | 12,000,000 | 120,000 | 100 | 5,508,000 | Mar. | 1889 | .50 | 2,148,000 | Aug. | 1871 | 1.50 |
| 151 | Yreka City, L. Z. | Mo. | 55,000 | 11,000 | 5 | | | | | 4,400 | July | 1889 | .10 |
| 152 | Woodside | Utah | | | | | | | | 25,000 | Oct. | 1889 | .25 |
| 153 | Young America | Cal. | | | | | | | | 175,000 | -- | 1889 | .10 |

## NON-DIVIDEND PAYING MINES.

| | Name and Location of Company. | Capital Stock. | Shares. No. | Shares. Par | Assessments. Total levied. | Assessments. Date and am't of last. | | |
|---|---|---|---|---|---|---|---|---|
| 1 | Agassiz Cons., S. L. | Colo. | $2,500,000 | 50,000 | $50 | * | | |
| 2 | Allegheny, S. | Colo. | 5,000,000 | 500,000 | 10 | | | |
| 3 | Alloucz, C. | Mich. | 2,000,000 | 80,000 | 25 | $737,000 | Jan. | 1890 .70 |
| 4 | Alpha Con., G. S. | Nev. | 3,000,000 | 30,000 | 100 | 112,500 | Sept. | 1890 .25 |
| 5 | Alta, S. | Nev. | 10,080,000 | 100,800 | 100 | 3,359,800 | Sept. | 1890 .50 |
| 6 | Amador, G. | Cal. | 400,000 | 200,000 | 2 | * | | |
| 7 | American Flag, S. | Colo. | 1,250,000 | 125,000 | 10 | 300,000 | June | 1887 |
| 8 | Amity, S. | Colo. | 250,000 | 250,000 | 1 | | | |
| 9 | Anglo-Montana, Lt. | Mont. | 600,000 | 120,000 | 5 | | | |
| 10 | Astoria, G. | Cal. | 200,000 | 100,000 | 2 | | | |
| 11 | Barcelona, G. | Nev. | 5,000,000 | 200,000 | 25 | * | | |
| 12 | Bechtel Con., G. | Cal. | 10,000,000 | 100,000 | 100 | 173,500 | Jan. | 1883 .10 |
| 13 | Belmont, S. | Nev. | 5,000,000 | 100,000 | 100 | 735,000 | April | 1886 .10 |
| 14 | Best & Belcher, G. S. | Nev. | 10,080,000 | 100,800 | 100 | 2,279,275 | Aug. | 1890 .25 |
| 15 | Big Pittsburg, S. L. | Colo. | 20,000,000 | 200,000 | 100 | * | | |
| 16 | Black Oak, G. | Cal. | 3,000,000 | 300,000 | 10 | | | |
| 17 | Boston Con., G. | Cal. | 10,000,000 | 100,000 | 100 | 170,000 | Nov. | 1883 .25 |
| 18 | Bremen, S. | N. M. | 5,000,000 | 500,000 | 10 | * | | |
| 19 | Brownlow, S. | Colo. | 250,000 | 250,000 | 1 | | | |
| 20 | Brunswick, G. | Cal. | 2,000,000 | 400,000 | 5 | * | | |
| 21 | Bullion, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 2,790,000 | Dec. | 1889 .25 |
| 22 | Butte & Boston, C. S. | Mont. | 5,000,000 | 200,000 | | | | .25 |
| 23 | Calaveras, G. | Cal. | 500,000 | 500,000 | 1 | * | | |
| 24 | Carisa, G. | Wy. | 500,000 | 100,000 | 5 | * | | |
| 25 | Carupano, G. S. L. C. | Ven. | 200,000 | 100,000 | 2 | * | | |
| 26 | Cashier, G. S. | Colo. | 500,000 | 250,000 | 2 | * | | |
| 27 | Charles Dickens, G. S. | Idaho | 1,250,000 | 250,000 | 5 | * | | |
| 28 | Cherokee, G. | Cal. | 1,500,000 | 150,000 | 10 | | | |
| 29 | Choller, S. | Nev. | 11,200,000 | 112,000 | 100 | 1,540,000 | Nov. | 1889 .50 |
| 30 | Cleveland, S. | Dak. | 1,000,000 | 500,000 | 2 | * | | |
| 31 | Colchis, | N. M. | 500,000 | 50,000 | 10 | | | |
| 32 | Comstock, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 35,000 | Mar. | 1887 .15 |
| 33 | Con. Imperial, G. S. | Nev. | 5,000,000 | 50,000 | 100 | 1,875,000 | July. | 1890 .05 |
| 34 | Con. Pacific, G. | Cal. | 6,000,000 | 60,000 | 100 | 198,000 | June | 1890 .10 |
| 35 | Con. Silver, S. | Mo. | 2,500,000 | 250,000 | 10 | | | |
| 36 | Crescent, S. L. | Colo. | 3,000,000 | 300,000 | 10 | * | | |
| 37 | Crocker, S. | Ariz. | 10,000,000 | 100,000 | 100 | 150,000 | June | 1890 .15 |
| 38 | Crowell, G. | N. C. | 500,000 | 500,000 | 1 | | | |
| 39 | Dahlonega, G. | Ga. | 250,000 | 250,000 | 1 | * | | |
| 40 | Dandy, S. | Colo. | 5,000,000 | 500,000 | 10 | | | |
| 41 | Decatur, S. | Colo. | 1,500,000 | 300,000 | 5 | * | | |
| 42 | Deer Park, S. L. | Colo. | 5,000,000 | 500,000 | 10 | * | | |
| 43 | Denver Gold, G. | Colo. | 300,000 | 60,000 | 5 | | | |
| 44 | Durango, G. | Colo. | 500,000 | 500,000 | 1 | * | | |
| 45 | Eastern Dev. Co., Lt. | N. S. | 1,500,000 | 150,000 | 10 | 990,000 | Mar. | 1886 1.00 |
| 46 | El Cristo, G. S. | U.S.C. | 1,000,000 | 500,000 | 2 | | | |
| 47 | El Dorado, G. | Cal. | 1,000,000 | 250,000 | 4 | * | | |
| 48 | El Talento, G. | U.S.C. | 1,000,000 | 500,000 | 2 | | | |
| 49 | Empire, S. | Utah | 10,000,000 | 100,000 | 100 | | | |
| 50 | Eureka Tunnel, S. L. | Nev. | 10,000,000 | 100,000 | 100 | * | | |
| 51 | Exchequer | Nev. | 10,000,000 | 100,000 | 100 | 865,000 | July. | 1890 .25 |
| 52 | Found Treasure, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 81,500 | May. | 1890 .25 |
| 53 | Gogebic I. Syn., I. | Wis. | 5,600,000 | 200,000 | 25 | | | |
| 54 | Gold Cup, S. | Colo. | 500,000 | 500,000 | 1 | * | | |
| 55 | Golden Gate, G. | Mont. | 2,000,000 | 200,000 | 10 | * | | |
| 56 | Gold Placer, G. | Colo. | 5,000,000 | 200,000 | 25 | 229,314 | Dec. | 1885 .25 |
| 57 | Gold Rock, G. | Cal. | 1,000,000 | 500,000 | 2 | * | | |
| 58 | Goodshaw, G. | Cal. | 10,000,000 | 100,000 | 100 | * | | |
| 59 | Grand Belt, C. | Tex. | 12,000,000 | 120,000 | 100 | | | |
| 60 | Grand Duke | Colo. | | 80,000 | 10 | | | |
| 61 | Great Remnance, G. | U.S.C. | 1,000,000 | 500,000 | 2 | * | | |
| 62 | Gregory-Bobtail, G. | Colo. | 550,000 | 550,000 | 1 | * | | |
| 63 | Gregory Con., G. | Mont. | 3,000,000 | 300,000 | 10 | | | |
| 64 | Hariem M. & M. Co., G. | Cal. | 1,000,000 | 200,000 | 5 | | | |
| 65 | Head Cent. & Tr., S. G. | Ariz. | 10,000,000 | 100,000 | 100 | | | |
| 66 | Hector, G. | Cal. | 1,500,000 | 300,000 | 5 | 45,000 | Jan. | 1889 .15 |
| 67 | Highland, C. | Mich. | 500,000 | 25,000 | 20 | | | |
| 68 | Holywood, C. | Cal. | 200,000 | 100,000 | 2 | | | |
| 69 | Hortense, S. | Colo. | 2,000,000 | 200,000 | 10 | | | |
| 70 | Huron, C. | Mich. | 1,000,000 | 40,000 | 25 | 280,000 | May. | 1887 3.00 |
| 71 | Iron, Gold & Silver, S. | N. M. | 2,000,000 | 200,000 | 10 | * | | |
| 72 | Ironton, I. | Wis. | 1,000,000 | 40,000 | 25 | | | |
| 73 | Iroquois, C. | Mich. | 1,250,000 | 50,000 | 25 | | | |
| 74 | J. D. Lambert | Ariz. | 10,000,000 | 100,000 | 100 | | | |
| 75 | Julia Con., G. S. | Nev. | 11,000,000 | 110,000 | 100 | 1,465,000 | Jan. | 1889 .10 |
| 76 | Lacrosse, G. | Colo. | 1,000,000 | 100,000 | 10 | * | | |
| 77 | Lee Basin, S. L. | Colo. | 5,000,000 | 500,000 | 10 | * | | |
| 78 | Mayflower Gravel | Cal. | 1,000,000 | 100,000 | 10 | 585,000 | Mar. | 1890 .56 |
| 79 | Medora, G. | Dak. | 250,000 | 250,000 | 1 | * | | |
| 80 | Mexican, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 2,791,960 | Oct. | 1890 .25 |
| 81 | Middle Bar, G. | Cal. | 400,000 | 200,000 | 2 | * | | |
| 82 | Mike & Starr, S. L. | Colo. | 1,000,000 | 200,000 | 5 | * | | |
| 83 | Mollie Gibson | Colo. | 2,000,000 | 100,000 | 2 | | | |
| 84 | Monitor, G. | Colo. | 100,000 | 1,000,000 | 1 | * | | |
| 85 | Mutual Mg. & Sm. | W'sh. | 100,000 | 100,000 | 1 | * | | |
| 86 | Native, C. | Mich. | 1,000,000 | 40,000 | 25 | | | |
| 87 | Neath, G. | Colo. | 1,000,000 | 100,000 | 10 | | | |
| 88 | Nevada Queen, S. | Nev. | 10,000,000 | 100,000 | 100 | 200,000 | Oct. | 1889 .25 |
| 89 | New Germany, G. | N. S. | 100,000 | 100,000 | 1 | * | | |
| 90 | New Pittsburg, S. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | |
| 91 | N. Commonw'h, S. | Nev. | 10,000,000 | 100,000 | 100 | 85,000 | April | 1890 .25 |
| 92 | North Standard, G. | Cal. | 10,000,000 | 100,000 | 100 | 20,000 | Nov | |
| 93 | Noonday, | Cal. | 600,000 | 60,000 | 10 | 308,000 | Dec. | 1881 .10 |
| 94 | Oneida Chief, G. | Cal. | 500,000 | 125,000 | 100 | * | | |
| 95 | Oriental & Miller, S. | Nev. | 10,000,000 | 400,000 | 25 | * | | |
| 96 | Osceola, G. | Nev. | 5,000,000 | 500,000 | 10 | * | | |
| 97 | Overman, G. S. | Nev. | 11,520,000 | 115,200 | 100 | 3,832,800 | Dec. | 1889 .25 |
| 98 | Park, S. | Utah | 2,000,000 | 200,000 | 10 | | | |
| 99 | Peer, S. | Ariz. | 10,000,000 | 100,000 | 100 | 165,000 | Oct. | 1890 .10 |
| 100 | Peerless, S. | Ariz. | 10,000,000 | 100,000 | 100 | 405,000 | Oct. | 1890 .15 |
| 101 | Phœnix, | Ariz. | 500,000 | 500,000 | 1 | * | | |
| 102 | Phœnix, G. S. | Ark. | 5,000,000 | 200,000 | 25 | * | | |
| 103 | Phœnix Lead, S. L. | Colo. | 100,000 | 100,000 | 1 | * | | |
| 104 | Pilgrim, G. | Cal. | 600,000 | 300,000 | 2 | * | | |
| 105 | Potosi, S. | Nev. | 11,200,000 | 112,000 | 100 | 1,573,000 | Mar. | 1890 .50 |
| 106 | Proustite, S. | Idaho | 250,000 | 250,000 | 1 | * | | |
| 107 | Puritan, S. G. | Colo. | 1,500,000 | 150,000 | 10 | * | | |
| 108 | Quincy, | Colo. | 3,000,000 | 300,000 | 10 | | | |
| 109 | Rappahannock, G. S. | Va. | 250,000 | 250,000 | 1 | * | | |
| 110 | Red Elephant, S. | Colo. | 500,000 | 500,000 | 1 | * | | |
| 111 | Ropes, G. S. | Mich. | 2,000,000 | 80,000 | 25 | 147,200 | July. | 1887 .50 |
| 112 | Russell, G. | Nev. | 1,500,000 | 300,000 | 5 | * | | |
| 113 | Sampson, G. S. L. | Utah | 10,000,000 | 100,000 | 100 | 288,157 | July. | 1888 1.00 |
| 114 | San Sebastian, G. | San S. | 1,600,000 | 320,000 | 5 | * | | |
| 115 | Santa Fe, C. | N.

# NEW YORK MINING STOCKS QUOTATIONS.

## DIVIDEND-PAYING MINES.

| NAME AND LOCATION OF COMPANY. | Jan. 10. | | Jan. 12. | | Jan. 13. | | Jan. 14. | | Jan. 15. | | Jan. 16. | | SALES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Adams | | | | | | | | | | | | | |
| Alice | | | | | | | | | | | | | |
| Atlantic, Mich | | | | | | | | | | | | | |
| Belcher, Nev | | | | | | | | | | | | | |
| Belle Isle | | | | | | | | | | | | | |
| Bodie Cons., Cal | | | | | | | .95 | | | | | | 100 |
| Bos. & Mont., Mont | | | | | | | | | | | | | |
| Breece, Colo | | | | | | | | | | | | | |
| Bulwer, Cal | | | | | | | | | | | | | |
| Caledonia | | | | | .60 | | .60 | | | | | | 200 |
| Calumet & Hecla, Mich | | | | | 261¼ | | | | | | | | 6 |
| Catalpa, Colo | | | | | | | | | | | | | |
| Chrysolite, Colo | | | | | | | | | .25 | | .25 | | 100 |
| Colorado Cen.,Con,.Colo | | | | | 1.25 | | | | | | | | 100 |
| Cons. Cal. & Va., Nev | | | 3.55 | | 4.90 | 4.65 | 4.90 | | | | 4.15 | 4.10 | 820 |
| Crown Point, Nev | 1.75 | | 1.85 | | | | 1.95 | | | | | | 300 |
| Deadwood, Dak | | | | | | | | | | | | | |
| Eureka Con | | | 3.25 | | 3.50 | | | | | | | | 225 |
| Excelsior, Cal | | | | | | | | | | | | | |
| Father de Smet | | | | | | | | | | | | | |
| Franklin | | | | | | | | | | | | | |
| Freeland, Colo | | | | | | | | | .18 | | | | 1,000 |
| Gould & Curry, Nev | 2.15 | | 2.50 | | | | | | 2.55 | | | | 350 |
| Hale & Norcross, Nev | | | | | | | 1.80 | 1.75 | | | 2.00 | | 400 |
| Holyoke | | | | | | | | | | | | | |
| Homestake, Dak | | | | | | | | | | | | | |
| Horn-Silver, Utah | | | 3.10 | | | | | | | | | | 100 |
| Independence, Nev | | | | | | | | | | | | | |
| Iron Hill, Dak | | | | | | | | | | | | | |
| Kearsarge | | | | | 11.83 | | | | | | | | 50 |
| Leadville C., Colo | | | .12 | | | | | | | | .13 | | 1,000 |
| Little Chief, Colo | | | .37 | | .39 | | | | | | .39 | .36 | 800 |
| Mono, Cal | | | | | | | | | | | | | |
| Moulton, Mont | | | | | | | | | | | | | |
| Mt. Diablo, Nev | | | | | | | | | | | | | |
| Navajo, Nev | | | | | | | | | | | | | |
| N. Belle Isle, Nev | | | | | | | | | .60 | | | | 100 |
| Ontario, Utah | | | | | | | | | | | | | |
| Ophir, Nev | 3.15 | | | | 3.85 | | 3.60 | | | | 3.55 | | 400 |
| Osceola, Mich | | | | | | | 35.12 | | | | | | 50 |
| Plymouth, Cal | | | | | | | 2.40 | | | | | | 100 |
| Quicksilver, Pref | | | | | | | | | | | | | |
| " Com | | | | | | | | | | | | | |
| Quincy, Mich | | | | | | | 93.50 | | | | | | 20 |
| Robinson Cons., Colo | | | | | | | | | | | | | |
| Savage | | | 1.95 | | | | | | 2.00 | | 2.15 | | 100 |
| Sierra Nevada, Nev | | | | | 2.00 | | | | | | 1.90 | | 200 |
| Silver Cord | | | | | | | | | | | | | |
| Silver King, Ariz | | | | | | | .20 | | | | | | 100 |
| Silver Mg. of L. V | | | | | | | | | | | | | |
| Small Hopes | | | | | | | | | | | | | |
| Standard | | | | | | | | | | | | | |
| Stormont, Utah | | | | | | | | | | | .07 | .06 | 400 |
| Tamarack, Mich | | | | | | | | | | | | | |
| Yellow Jacket, Nev | 1.85 | | 2.00 | | | | | | | | 2.30 | | 300 |

## NON-DIVIDEND-PAYING MINES.

| NAME AND LOCATION OF COMPANY. | Jan. 10. | | Jan. 12. | | Jan. 13. | | Jan. 14. | | Jan. 15. | | Jan. 16. | | SALES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Alpha, Nev | | | | | | | | | | | | | |
| Alta, Nev | | | .75 | | .80 | .75 | .80 | | .70 | | 2.30 | | 1,400 |
| American Flag, Colo | | | | | | | .05 | | | | | | 300 |
| Andes, Nev | | | | | | | | | | | | | |
| Amador, Cal | | | | | | | | | | | | | |
| Astoria, Cal | .04 | .03 | .04 | .03 | .04 | | .05 | | | | .04 | | 5,100 |
| Barcelona, Nev | | | | | | | | | | | | | |
| Best & Belcher, Nev | 2.50 | | | | | | 3.45 | | | | 2.70 | 2.65 | 400 |
| Bonanza King, Cal | | | | | | | | | | | | | |
| Brunswick, Cal | .08 | | .09 | | .09 | .08 | .09 | | .09 | .08 | .09 | | 3,700 |
| Bullion, Nev | | | | | 2.50 | | | | | | | | 100 |
| Butte & Bost., Mont | | | | | | | | | | | | | |
| Castle Creek, Idaho | | | | | | | | | | | | | |
| Chollar, Nev | 2.15 | | 2.30 | | 2.50 | | | | | | 2.60 | | 500 |
| Col. & Beaver, Idaho | | | | | | | | | | | | | |
| Commonwealth, Nev | | | | | | | | | | | | | |
| Comstock T., Nev | .14 | | | | | | .15 | | | | | | 1,000 |
| " bonds | | | | | | | | | | | | | |
| " scrip | | | | | | | | | | | | | |
| Con. Imperial, Nev | | | | | | | | | | | | | |
| Cons. Pacific, Cal | | | | | | | | | | | | | |
| Crescent, Colo | | | | | | | | | | | | | |
| Del Monte, Nev | | | | | | | | | | | | | |
| El Cristo, Rep. of Col | | | | | | | | | | | | | |
| Exchequer | | | | | .80 | | | | | | | | 100 |
| Hollywood, Cal | | | | | | | | | | | | | |
| Huron, Mich | | | | | 3.25 | | | | | | | | 200 |
| Julia, Nev | .36 | | .31 | | .31 | | .30 | | .30 | | .29 | | 2,000 |
| Justice, Nev | | | | | | | | | | | | | |
| Kossuth | | | | | | | | | | | | | |
| Lacrosse, Colo | | | | | | | | | | | | | |
| Lee Basin, Colo | | | | | | | | | | | | | |
| Mexican, Nev | 2.55 | | 2.50 | | | | | | | | | | 300 |
| Middle Bar | .07 | | .05 | .04 | .05 | .04 | .05 | | .08 | .05 | .06 | .05 | 8,500 |
| Monitor, Colo | | | | | | | | | | | | | |
| Mutual Sm. & Mg. Co | 1.50 | | 1.50 | | 1.50 | | 1.45 | | 1.45 | | 1.40 | | 1,900 |
| Nevada Queen, Nev | | | | | | | | | | | | | |
| N. Commonwealth, Nev | | | | | | | | | | | | | |
| Occidental, Nev | | | .80 | | | | .90 | | | | | | 600 |
| Oriental & Mill, Nev | | | | | | | | | | | | | |
| Overman, Nev | | | | | | | | | | | | | |
| Phœnix of Ariz | .59 | .58 | .50 | | .57 | .50 | .62 | .58 | .61 | .57 | .65 | .60 | 5,800 |
| Phœnix Lead, Colo | | | | | | | | | | | | | |
| Potosi | | | | | | | 4.10 | | | | | | 10 |
| Rappahannock | .02 | | | | | | | | | | | | 1,000 |
| S. Sebastian | | | | | | | | | | | | | |
| Scorpion | | | | | | | | | | | .25 | | 300 |
| Seg Belcher, Nev | | | | | | | 1.20 | | | | | | 100 |
| Silver Queen | | | | | | | | | | | | | |
| Sullivan Con., Dak | | | | | | | | | | | | | |
| Sutro Tunnel, Nev | | | | | | | | | | | | | |
| Sutter Creek, Cal | 1.10 | | 1.10 | | 1.10 | | 1.10 | | 1.10 | | | | 600 |
| Tioga, Cal | | | | | | | | | | | | | |
| Union Cons., Nev | 2.60 | | | | | | | | | | | | 100 |
| Utah, Nev | .80 | | .85 | | | | .85 | | | | | | 1,100 |

*Ex dividend. †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 7,921. Non-dividend shares sold 24,510, Total, New York, 42,431.

# BOSTON MINING STOCK QUOTATIONS.

| NAME OF COMPANY. | Jan. 9. | | Jan. 10. | | Jan. 12. | | Jan. 13. | | Jan. 14. | | Jan. 15. | | SALES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atlantic, Mich | | | | | 16.00 | | 16.00 | | | | 15.50 | | 225 |
| Bodie, Cal | | | | | | | | | | | | | |
| Bonanza Development | | | | | | | .50 | | .50 | | .50 | | 500 |
| Bost. & Mont., Mont | | | 41.00 | 40.88 | 40.50 | 40.00 | 41.50 | 40.25 | 42.00 | 41.50 | 42.00 | 41.00 | 3,891 |
| Breece, Colo | | | | | | | | | | | | | |
| Calumet & Hecla, Mich | | | | | 260 | 258 | | | 260 | 255 | 260 | | 39 |
| Catalpa, Colo | | | | | | | | | .25 | | .30 | .25 | 2,700 |
| Central, Mich | | | | | | | | | | | | | |
| Chrysolite Colo | | | | | | | | | | | | | |
| Con. Cal. & Va., Nev | | | | | | | | | | | | | |
| Dunkin, Colo | | | | | | | .65 | .55 | | | | | 550 |
| Eureka, Nev | | | | | | | | | | | | | |
| Franklin, Mich | | | | | 17.50 | | 17.00 | | 17.50 | | | | 270 |
| Honorine, Utah | | | | | | | | | | | | | |
| Horn Silver, Utah | | | | | | | | | | | | | |
| Kearsarge | | | | | | | | | 12.50 | 12.00 | | | 420 |
| Little Chief, Colo | | | | | | | | | | | | | |
| Little Pittsburg, Colo | | | | | | | | | | | | | |
| Moulton | | | | | | | | | | | | | |
| Napa, Cal | | | | | | | | | | | | | |
| Ontario, Utah | | | | | | | | | | | | | |
| Osceola, Mich | | | 34.75 | 34.00 | 34.25 | 33.75 | 34.50 | 33.75 | 36.00 | 35.00 | 35.75 | 35.00 | 641 |
| Pewabic, Mich | | | | | | | | | | | | | |
| Quincy, Mich | | | | | | | | | | | 93.00 | 93.00 | 19 |
| Ridge, Mich | | | | | | | | | | | | | |
| Sierra Nevada, Nev | | | | | | | | | | | | | |
| Silver King | | | | | | | | | | | | | |
| Stormont, Utah | | | | | | | | | | | | | |
| Tamarack, Mich | | | | | 150 | | 150 | | 150 | | | | 74 |
| Tecumseh, Mich | | | | | | | | | | | | | |

| NAME OF COMPANY. | Jan. 9. | | Jan. 10. | | Jan. 12. | | Jan. 13. | | Jan. 14. | | Jan. 15. | | SALES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allouez, Mich | | | | | | | | | 2.63 | 2.50 | | | 156 |
| Arnold, Mich | | | | | | | | | | | | | |
| Aztec, Mich | | | | | | | | | | | | | |
| Brunswick, Cal | | | | | | | | | | | | | |
| Butte & Boston, Mont | | | | | | | 15.00 | 14.50 | 16.25 | 15.25 | 17.00 | 16.00 | 16.38 | 16.00 | 2,700 |
| Centennial, Mich | | | | | | | 16.50 | 16.25 | | | 18.00 | 16.88 | | | 335 |
| Comstock, T., Nev | | | | | | | | | | | | | | | |
| Copper Falls Mg | | | | | | | | | | | | | | | |
| Crescent, Colo | | | | | | | | | | | | | | | |
| Dana, Mich | | | | | | | | | | | | | | | |
| Don Enrique, N. M | | | | | | | | | | | | | | | |
| El Cristo, S. A | | | | | | | | | | | | | | | |
| Hanover, Mich | | | | | | | | | | | | | | | |
| Humboldt, Mich | | | | | | | | | | | | | | | |
| Hungarian, Mich | | | | | | | | | | | | | | | |
| Huron, Mich | | | | | | | | | | | | | | | |
| Mesnard, Mich | | | | | | | | | | | | | | | |
| National, Mich | | | | | | | 3.00 | 2.88 | 3.50 | 3.13 | 3.50 | 3.38 | 3.50 | | 2,095 |
| Native, Mich | | | | | | | | | | | | | | | |
| Oriental & M., Nev | | | | | | | | | | | | | | | |
| Phoenix | | | | | | | | | | | | | | | |
| Pontiac | | | | | | | | | | | | | | | |
| Rappahannock, Va | | | | | | | | | | | | | | | |
| Santa Fe, N. Mex | | | | | | | .40 | | .45 | .42½ | .42½ | | .45 | | 4,000 |
| Shoshone, Idaho | | | | | | | | | | | | | | | |
| South Side, Mich | | | | | | | | | | | | | | | |
| Star | | | | | | | | | | | | | | | |
| Washington, Mich | | | | | | | | | | | | | | | |
| Winthrop, Mich | | | | | | | | | | | | | | | |

Boston: Dividend shares sold, 9,329. Non-dividend shares sold, 9,486. Total Boston, 18,815.

## San Francisco Mining Stock Quotations.

| COMPANY. | CLOSING QUOTATIONS. | | | | | |
|---|---|---|---|---|---|---|
| | Jan. 9. | Jan. 10. | Jan. 12. | Jan. 13. | Jan. 14. | Jan. 15. |
| Alpha | | | | | | |
| Alta | .60 | .60 | .65 | .70 | .60 | .65 |
| Belcher | | | | | | |
| Belle Isle | .35 | | .35 | .30 | | .40 |
| Best & Bel | 2.35 | 2.35 | 2.10 | 3.30 | 2.65 | 2.50 |
| Bodie | .75 | .75 | .80 | .85 | .85 | .80 |
| Bulwer | .15 | .15 | .20 | .20 | .20 | .20 |
| Challar | 1.95 | 2.05 | 2.30 | 2.25 | 2.20 | 2.45 |
| Com'wealth | | .75 | .85 | .75 | .75 | .70 |
| Con. C. & V. | 3.00 | 3.80 | 4.80 | 4.75 | 3.90 | 4.00 |
| Con. Pacific | | | | | | |
| Crown Point | 1.60 | 1.70 | 1.90 | 1.90 | 1.80 | 1.85 |
| Eureka C | | | | 4.00 | | |
| Gould & C | 2.00 | 2.40 | 3 05 | 3.30 | 2.80 | 2.60 |
| Grand Prize | | | | | | |
| Hale & N | 1.30 | 1.40 | 1.55 | 1.85 | 1.65 | 1.85 |
| M. White | | | | | | |
| Mexican | 2.40 | 2.35 | 2.30 | 2.60 | | 2 35 |
| Mono | .50 | .50 | .55 | .55 | .60 | .55 |
| Mt. Diablo | | | | | | |
| Navajo | .15 | .15 | .15 | .15 | .15 | .15 |
| Nev. Queen | | | .30 | .30 | | .30 |
| N. Belle Isle | | | | | .75 | |
| N.Com'w'lth | | | | | | |
| Ophir | 2.95 | 3.05 | 3.60 | 3.50 | 3.20 | 3.20 |
| Potosi | 4.65 | 4.60 | 4.90 | 4.55 | 4.55 | 4.80 |
| Savage | 1.65 | 1.75 | 2.10 | 2.25 | 2.20 | 2.50 |
| Sierra Nev | 1.60 | 1.70 | 1.90 | 1.85 | 1.75 | 1.70 |
| Union Con | 1.80 | 1.90 | 2.05 | 1.95 | 1.80 | 1.80 |
| Utah | .70 | .70 | .90 | .80 | .75 | .70 |
| Yellow Jak | 1.75 | 1.85 | 2.65 | 2.35 | 2.10 | 2.20 |

# COAL STOCKS.

| NAME OF COMPANY. | Par val. of shares. | Jan. 10. | | Jan. 12. | | Jan. 13. | | Jan. 14. | | Jan. 15. | | Jan. 16. | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| American Coal | | | | | | | | | | | | | | |
| Cambria Iron | | | | | | | | | | | | | | |
| Cameron Coal & I.Co | | | | | | | | | | | | | | |
| Ches. & O. RR | 100 | | | | | | | | | | | | | |
| Chic. & Ind. Coal RR | 100 | | | | | | | | | | | | | |
| Do. pref | 100 | | | | | | | | | | | | | |
| Col. C. & I | 100 | 38⅜ | 36⅞ | 38⅜ | 36½ | 38¼ | 37⅛ | 38⅝ | 36⅞ | 37¾ | 35¾ | 36½ | 35⅜ | 7,605 |
| Col. & Hocking C. I. | 100 | 18 | | 18¼ | 18¼ | 18⅛ | 17½ | 19⅝ | 18½ | | | | | 2,300 |
| Consolidation Coal | 100 | | | | | | | | | | | | | |
| Del. & H. C | 100 | 136¼ | 136 | 136 | 133⅞ | 135 | 134¼ | 135¼ | 135⅛ | 136 | 135¼ | 134⅜ | 134 | 3,121 |
| D., L. & W. RR | 50 | 138⅞ | 137⅞ | 139⅜ | 137 | 138½ | 136⅞ | 139⅜ | 138 | 139¼ | 138 | 138 | 137 | 66,0 3 |
| Hocking Valley | 100 | 28¾ | 28 | 28⅞ | 28 | 29 | 28 | 29 | 28½ | 28¼ | 28 | 27¼ | 27 | 5,583 |
| Hunt. & Broad Top | | 20 | | 20 | 19⅞ | 20 | | | | 19½ | | | | 535 |
| Do. pref | | 46½ | | 45 | | | | 44½ | | | | | | 180 |
| Illinois C. & Coke Co | | | | | | | | | | | | | | |
| Lehigh C. & N | 50 | 48⅜ | 48⅛ | 48⅛ | 48¼ | 48⅜ | 48⅛ | 48¼ | 48 | 48¼ | 48 | | | 2,370 |
| Lehigh Valley RR | 50 | 50⅝ | 49⅞ | 50¼ | 50 | 50 | 49¾ | 50⅛ | 49⅞ | 50⅛ | 50 | | | 1,371 |
| Lehigh & Wilk. Coal | 100 | | | | | | | | | | | | | |
| Mahoning Coal | 100 | | | | | | | | | | | | | |
| Do. pref | 100 | | | | | | | | | | | | | |
| Maryland Coal | | 17½ | | 17 | | 17 | | | | | | | | 450 |
| Morris & Essex | 100 | | | 145 | | | | | | 146¾ | | | | 70 |
| New Central Coal | 50 | 11⅞ | 11 | 10¾ | | | | 11 | | | | | | 500 |
| N. J. C. RR | 100 | 116 | | 118 | 116½ | 118 | 115 | 117¾ | 116½ | 115 | | 115 | 114¼ | 2,720 |
| N. Y. & S. Coal | 100 | | | | | | | | | | | | | |
| N. Y., Susq. & West | 100 | 8¾ | 8¾ | 9⅝ | 8¼ | 8¾ | 8½ | 9¾ | 9⅛ | 9 | 8¼ | | | 11,740 |
| Do. pref | 100 | 31¾ | | 35 | 31 | 31⅞ | 31 | 36⅝ | 34¾ | 34½ | 33¼ | 34½ | 33 | 7,705 |
| N.Y. & Perry C. & I. | 100 | | | | | | | | | | | | | |
| Norfolk & West. RR. | 50 | | | 16 | 15⅝ | 16 | | 16¾ | 16¼ | 16 | | 16½ | 15½ | 1,630 |
| Do. pref | 50 | 55½ | 55 | 57 | 56¾ | 57⅛ | | 57½ | 56½ | | | | | 1,822 |
| Penn. Coal | 50 | | | | | | | | | | | | | |
| Penn. RR | 50 | 51 | 50¾ | 51¼ | 51 | 51⅜ | 51¼ | 52⅝ | 51⅛ | 52 | 51⅞ | | | 8,699 |
| Ph. & R. RR | | 33⅞ | 33 | 33⅝ | 32¾ | 33⅞ | 32½ | 34¼ | 33¼ | 33⅞ | 33 | 33¼ | 32⅝ | **93,065 |
| Sunday Creek Coal | | | | | | | | | | | | | | |
| Do. pref | 100 | | | | | | | | | | | | | |
| Tennessee C. & I. Co | | 35¾ | | 38 | 36 | 36⅞ | 35½ | 39½ | 38 | 39¼ | 38½ | 39½ | 36 | 11,605 |
| Do. pref | | 84¼ | 84 | 84½ | | 83 | | 86 | 85¾ | | | | | 1,100 |
| Westmoreland Coal | | | | | | | | | | | | | | |

**Sales in New York, 45,440; in Philadelphia, 47,625. Total sales, 229,944.

## STOCK MARKET QUOTATIONS.

### Baltimore, Md.

| COMPANY. | Bid. L. H. | Asked. L. H. |
|---|---|---|
| Atlantic Coal | $.85@.90 | $1.50 |
| Balt. & N. C. | .05@.07 | .15 |
| big Vein Coal | .... | 1.25 |
| Conrad Hill | .... | .10 |
| Cons. Coal | .25½@.26 | 27½@.28½ |
| Diamond Tunnel | .... | .... |
| George's Crk. C. | 1.14 | 1.15 |
| Lake Chrome | ... | .... |
| Maryland & Charlotte | ... | ... |
| North State | .10 | .... |
| Silver Valley | .50@.55 | .63@.70 |

Prices bid and asked, lowest and highest, during the week ending January 15.

### Birmingham, Ala. Jan. 14.

| COMPANY. | Bid. L. H. | Asked. L. H. |
|---|---|---|
| Ala. Coal & I. Co. | .... | $100 |
| Ala. Conn. C. & C. Co. | .... | $23 |
| Ala. R. Mill Co. | $100 | .... |
| *Alice Furnace | $101 | .... |
| Anna Howe G. Mg. Co. | $⅛ | $⅜ |
| Bessemer Land | $23¾ | .... |
| Bir. Mg. & Mfg. | .... | $35 |
| Cahaba Coal Mg. Co. | .... | $61 |
| Camille Gold Mg. Co. | $½ | .... |
| De Bardeleben C. & I. Co. | $48 | .... |
| Decat. L. Imp. | $9 | $10 |
| Decatur Min. L. | .... | $19 |
| Ensley Land | $6½ | $8 |
| *Eureka | .... | .... |
| Florence L. & Mg. Co. | $17 | $19 |
| Gadsen Land | $3¾ | $4 |
| Hecla Coal Co. | .... | .... |
| Hen. S. & M. Co. | ... | $15 |
| Jagger-Towni'y C. & C. Co. | $8½ | $10 |
| Mag-Ellen | $100 | .... |
| Mary Lee C. & R. Co. | .... | $25 |
| Sheffield C. & I. Co. | .... | $40 |
| Sloss I. & S | $20 | $30 |
| †Sloss I. & S | $84 | .... |
| ‡‡ Sloss I. & S. | .... | $45 |
| Tuscaloose C. I. & L. Co. | .... | $24 |
| Ten. C. & I. Co. | $34 | .... |
| " pref. | $78 | $80 |
| Vulcan C. & C. Co | $5 | .... |
| Woodstock I. Co. | .... | $30 |

* Bonds. † First mortgage. ‡‡ Second mortgage. ** Without interest.

### Pittsburg, Pa. Jan. 14.

| COMPANY. | B. | A. | Closing. |
|---|---|---|---|
| Allegheny Gas Co. | $40.00 | ..... | $40.00 |
| Bridgewater Gas Co. | ..... | $..... | ..... |
| Chartiers Val. Gas | 8.09 | 9.00 | ..... |
| Columbia Oil Co. | 2.25 | 3.00 | 3.00 |
| Consignee Mg. Co. | .25 | ..... | ..... |
| Consolidated Gas Co. | ..... | ..... | ..... |
| East End E. Light Co. | ..... | ..... | ..... |
| East End Gas Co | ..... | ..... | ..... |
| Forest Oil | ..... | ..... | ..... |
| Hazlewood Oil Co. | ..... | ..... | ..... |
| La Noria Mining | .15 | .18 | .16 |
| Luster Mg. Co. | 18.13 | 19.00 | 18.50 |
| Mansfield C. & C. Co. | ..... | ..... | ..... |
| Manuf'turers Gas Co. | 20.00 | ..... | 20.00 |
| Nat. Gas Co. of W. Va | ..... | ..... | ..... |
| N. Y. & Clev. Gas Coal. | 38.00 | ..... | ..... |
| Ohio Valley Gas | ..... | 25.00 | 25.00 |
| Pennsylvania Gas | ..... | 9.50 | 9.50 |
| People's Natural Gas. | ..... | ..... | ..... |
| People's N. G. & P. Co. | 7.50 | 8.38 | 8.00 |
| Philadelphia Co. | 9.38 | 9.63 | 9.13 |
| Pine Run Gas Co. | ..... | 35.00 | ..... |
| Pittsburg Gas | ..... | ..... | ..... |
| Silverton Mg. Co. | ..... | ..... | ..... |
| South Side Gas | 25 25 | 26.00 | 25.75 |
| Tuna Oil Co. | ..... | ..... | ..... |
| Union Gas | ..... | 90.00 | ..... |
| Washington Oil Co. | 90.00 | 90.00 | 74.00 |
| W'house Brake Co. | ..... | 74.00 | ..... |
| W'house A. B. Co. | ..... | 95.00 | ..... |
| W'house E. Light. | 7.25 | 7.75 | 7.50 |
| W'moreland & Camb. | 17.00@18.00 | | 17.00 |
| Wheeling Gas | ..... | 15.00 | ..... |
| Yankee Girl Mg | ..... | ..... | ..... |

### St. Louis. Jan. 14.

CLOSING PRICES.

| COMPANY. | Bid. | Asked. |
|---|---|---|
| Adams, Colo. | $ ..... | $1.95 |
| American & Nettie | .11¼ | .50 |
| Aztec, N. Mex. | .08 | ..... |
| Bi-Metallic | ..... | ..... |
| Central Silver | .06½ | .07½ |
| Cleveland, Colo. | ..... | ..... |
| Cleveland & An'r. | ..... | ..... |
| Coeur d'Alene | ..... | ..... |
| Elizabeth | 2.50 | 2.55 |
| Gold King | .08 | .10½ |
| Granite Mountain, Mont. | ..... | ..... |
| Hope | ..... | ..... |
| Ingram | ..... | ..... |
| I. X. L., Colo. | ..... | ..... |
| La Union | .02 | .02½ |
| Little Albert | .15 | ..... |
| Montrose Placer, Colo. | .47½ | .50 |
| Major Budd, Mont. | ..... | ..... |
| Mexican Imp | ..... | ..... |
| Mickey Breen | .80 | .82½ |
| Mountain Key | ..... | ..... |
| Nellie | ..... | ..... |
| Old Colony | ..... | ..... |
| Pat Murphy, Colo. | .03 | .04 |
| Puzzle | ..... | ..... |
| Richmond Hill | ..... | ..... |
| Samoa | ..... | ..... |
| Silver Age, Colo. | 1.45 | ..... |
| Small Hopes, Colo. | .85 | ..... |
| Tourtelotte | ..... | ..... |
| West Granite, Mont. | ... | .... |
| Wire Patch | .13½ | .15 |
| Yuma, Ariz. | .46¼ | .50 |

### Trust Stocks. Jan. 16.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

| | | |
|---|---|---|
| Am. Cotton Oil. Tr. Repts | $21 | @$21½ |
| Cattle Trust | ..... | @ .... |
| Distillers' & Cattle Feeders'. | 47⅜ | @ 47¾ |
| Linseed Oil | 39 | @ 41 |
| National Lead | 20¼ | @ 20⅝ |
| Standard Oil | 161½ | @163 |
| Sugar Refineries, Tr. repts | 78⅜ | @ 78½ |

### Trust Receipts.

Sales at the New York Stock Exchange week ending Jan. 16:

| | Sales. | Price H. | Price L. |
|---|---|---|---|
| *American Cotton Oil | 10,035 | 23½ | 20 |
| National Lead | 50,482 | 20¼ | 18⅞ |
| *Sugar | 180,981 | 83½ | 67½ |

* Trust receipts.

### Foreign Quotations.

| London. COMPANY. | Highest. | Jan. 2. Lowest. |
|---|---|---|
| Almada, Mex. | 2s. 3d. | 2s. |
| Amador, Cal. | £⅛ | £⅜ |
| Appalachian, N. C. | 6d. | 3d. |
| Canadian Phos., Can. | £⅛ | £¼ |
| Colorado, Colo. | 2s. 6d. | 2s. |
| Comstock, Utah. | .... | .... |
| Cordova | .... | .... |
| Cons. Esmeralda, Nev. | 2s. 9d. | 2s. 3d. |
| Denver Gold, Colo. | .... | 6d. |
| Dickens Custer, Idaho. | 1s. 9d. | 1s. 3d. |
| East Arevalo, Idaho. | 2s. | 1s. |
| El Callao, Venezuela | .... | .... |
| Elmore, Idaho | 2s. | 1s. 6d. |
| Garfield, Nev | 1s. 3d. | 9d. |
| Jay Hawk, Mont. | 1s. 3d. | 9d. |
| Josephine, Cal. | 1s. 6d. | 6d. |
| Kohinoor, Colo. | 2s. 3d. | 1s. 9d. |
| La Luz, Mex. | 2s. | 1s. 6d. |
| La Valera, Mex. | 20s. | 15s. |
| Montana Lt., Mont. | 17s. | 15s |
| New California, Colo. | 6s. | 5s. |
| New Consolidated | 1s. 5d. | 9d. |
| New Eberhardt, Nev. | 1s. | 6d. |
| New Emma, S. Utah. | 3s. 3d. | 2s. 9d. |
| Newfoundland, N. F. | 3s. 6d. | 3s. |
| N. Gold Hill, N. C. | 2s. | 1s. 6d. |
| New Guston, Colo. | £3¼ | £2¾ |
| New Hoover Hill, N.C. | 1s. | 6d. |
| Old Lout, Colo | .... | .... |
| Palmarejo, Mex. | 12s. | 11s. |
| Pinos Altos, Mex. | 7s. | 6s. |
| Pittsburg Cons., Nev | 8s. | 7s. |
| Richmond Con., Nev. | £1¾ | £1½ |
| Ruby & Dunderb'g, Nev. | 1s. | 6d. |
| Sam Christian, N. C. | 1s. | 6d. |
| Sierra Buttes, Cal. | 5s. 6d. | 4s. 6d. |
| " Plumas Eur., Cal. | £11-16 | £9-16 |
| Sonora, Mex. | .... | .... |
| United Mexican, Mex. | 6s. 6d. | 5s. 6d. |
| U. S. Placer, Colo. | 9d. | 3d. |
| Viola Lt., Idaho | 1s. 6d. | 1s. |
| Yankee Girl, Colo. | £13-16 | £11-16 |

| Paris. | Jan. 1. Francs. |
|---|---|
| Belmez, Spain | 810.00 |
| Callao, Venez | 50.00 |
| Callao Bis., Venez | 5.50 |
| East Oregon, Ore. | 6.00 |
| Forest Hill Divide, Cal. | .... |
| Golden River, Cal. | 130.00 |
| " " parts | 30.00 |
| Lexington, Mont | 102.50 |
| " parts | 3.00 |
| Rio Tinto, Spain | 598.75 |
| Tharsis, Spain | 155.00 |

## CURRENT PRICES.

Those quotations are for wholesale lots in New York.

### CHEMICALS AND MINERALS.

**Acid**—Acetic, ℔ 100 lbs. $1.75@$2.00
Muriatic, 18° ℔ 100 lbs. 1.00@1.50
Muriatic, 20° ℔ 100 lbs. 1.12½@1.75
Muriatic, 22° ℔ 100 lbs. 1.37½@2.00
Nitric, 36° ℔ 100 lbs. 4.00@4.29
Nitric, 42° ℔ 100 lbs. 6.00@6.25
Oxalic, ℔ 100 lbs. 6.50@10.50
Sulphuric, 60° ℔ 100 lbs. 80@1.25
Sulphuric, 66° ℔ 100 lbs. 1.00@1.75

**Alkali**—
Refined, 48 p. c. 1.60@1.65
Refined, 58°. 1.55@1.60

**Alum**—Lump, ℔ lb 1¾
Ground, ℔ lb. 1¾@2
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10

**Ammonia**—Sul., ℔ 100 lbs. 3.15
Carb, ℔ lb. 7½@8¼

**Aqua Ammonia**—18° ℔ lb. 4¾
20°, ℔ lb. 6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11

**Ammoniates**—Azotine, ℔ unit 1 95@ 2 00
Blood, dried, red, ℔ unit, west 1 80@ 1 90
low grade, ℔ unit. 1 70@ 1 80
Concentrated tankage, ℔ unit 1 75@ 1 80
Bones, rough, ℔ ton. 20 00@23 00
ground, ℔ ton. 25 00@28 00
Bone black, refuse, ℔ ton. 17 50@19 50
Kieserite 6 00@ 6 50
Fish guano, dried 18 50@19 00
acidulated 10 00@— 00
wet 8 50@ 9 50
Phosphate rock, f. o. b Char'n undried 6 00@ 7 25
undried —@ 6 —
dried 7 00@ 7 50
ground 8 00@11 50
Acid phosphate, 14% per unit. 72½@ 75
Pearl 6¼@6½

**Arsenic**—White, powdered ℔ lb. 3¼@3½
Red ℔ lb. 5¾@ 6¼
White at Plymouth, ℔ ton £12 2 6

**Asbestos**—Am., ℔ ton. $50@$300
Italian, ℔ ton. c. i. f. L'pool £18@£60

**Ashes**—Pot, 1st sorts, ℔ lb. 4¾@4⅞
Pearl 6¼@6½

**Asphaltum**—P. ton. 13.00
Prime Cuban, ℔ lb. 4½@5½c.
Hard Cuban, P ton. $28.00
Trinidad, refined, ℔ ton. $30.00
Egyptian 8@9

**Barium**—Nitrate, ℔ lb. 8@8½

**Barytes**—Sulph., Am. prime white 17@20
Sulph., foreign, floated, ℔ ton. 19½@21.50
Sulph., off color, ℔ ton. 11.50@14.00
Carb., lump, f. o. b. L'pool, ton £6
No. 1. Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " 3 15 0

**Bleach**—Over 35 p. c., ℔ lb. 1.85@1.90

**Borax**—Refined, ℔ lb. 9½@9⅝
Concentrated 7¾@8⅜
Refined " Liverpool ℔ ton £29

**Brimstone**—*See Sulphur.*

**Bromine**—℔ lb. 37@38

**Chalk**—℔ ton. 1.75
Precipitated, ℔ lb. 4¾@5

**China Clay**—English, ℔ ton 13.50@18.50
Southern, ℔ ton. 13.50

**Chrome Yellow**—℔ lb. 10@2

**Cobalt**—Oxide, ℔ lb. 2.60@2.90

**Copper**—Sulph. English Wks. ton £20@£21

**Copperas**—Common, ℔ 100 lbs. 70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks. £1 15s.

**Cream of Tartar**—Am. 99%. 22½
Powdered, 99 p. c. 23

**Emery**—Grain, ℔ lb. 4½@5
Flour, ℔ lb. 2¾@3½

**Feldspar**—Ground, ℔ ton. 15.00

**Fuller's Earth**—Lump, ℔ bbl. 9.00@95
Powdered, ℔ lb. 1¾@2

**Gypsum**—Calcined, ℔ bbl. 1.25@1.50

**Iodine**—Resublimed 2.75

**Kainit**—℔ ton. $9.75@$10

**Kaolin**—*See China Clay.*

**Lead**—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb. 8½@8¾
Acetate, or sugar of, white. 12@13
Nitrate 9@10

**Lime Acetate**—Amer. Brown .95@1.00
" Gray 1.75@1.87½

**Litharge**—Powdered, ℔ lb. 6½@6¾
English flake, ℔ lb. 9@9½

**Magnesite**—Greek, ℔ ton. 20.00

**Manganese**—Crude, per unit. 23@28
Oxide, ground, per lb. 2½@6½

**Mercurie Chloride**—(*Corrosive Sublimate*) ℔ lb. 70@72

**Metallic Paint**—Brown per ton. $20@25
Red. $20@25

**Mineral Wool**—℔ lb 2

**Mica**—In sheets according to size.
1st quality, ℔ lb. 25@$6.00

**Naphtha**—Black 60

**Ochre**—Yellow, "B. F.," ℔ ton, f. o. b. mill. 30.00
"J. F. L. S.," ℔ lb. ex dock 2½
Yellow 10@25
Rochelle 1.35@1.50
Washed Dutch 5@—
Washed French 1½@2½
Washed Nat Oxford, Lump 6½@6¾
Washed Nat Oxford, Powder 7@7½
Goldeg 3¾@4
Domestic 3½@1½
Domestic, for O. C. & W. P. ⅞@1

**Oils, Mineral**
Cylinder, light filtered 15@20
Dark filtered 14@21
Extra cold test —@—
Dark steam refined 10@18

**Phosphate Rock**—S. Carolina, per ton f. o. b. Charleston. 6.00@7.25
Ground, ex vessel New York 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00

**Phosphorus**—℔ lb. 64@65
Precip., red 100@102
white 100@103

**Plumbago**—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7

**Potassium**—Cyanide, ℔ lb 39@40
Bromide, ℔ lb 33
Chlorate, English, ℔ lb 11@14
Chlorate, powdered 13@14
Carb, ℔ lb. 4.70@5.54
Caustic, ℔ lb. 7½@8
Iodide 2.65@2.70
Muriate, ℔ 100 lbs. 1.82½
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb. 10½@11
Dble. m'ure salt, basis of 48@50%. 1.07½
Sulphate, basis of 90% ℔ 100 lbs. 2.05
Yellow Prussiate 17½@18
Red Prussiate 42@45

**Pumice Stone**—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2¼@2½

**Pyrites**—Non-cupreous, p. units 10d.

**Quartz**—Ground, ℔ ton. 14.00@16.00

**Rotten Stone**—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb. 6@10

**Salt**—Liverpool, ground, ℔ sack 75@80
Turk's Island, ℔ bush. 25@28

**Salt Cake**—℔ lb. 70@75

**Saltpeter**—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb. 6@8

**Silex**, ℔ ton. 14@25

**Soda**—Carb Ash, 48%. 1.60@1.65
" high test. 1.55@1.60
Caustic ash, 48%. 1.62½@1.65
" high test. 1.60
Newcastle, 48%. — @ —
" high test. 1.50@1.55
Bicarb, English. 3.50@3.75
" American. 3@3½
Crystal, carbonate. 1.95@2.00
Caustic, 60%. 3.40@5.50
" 70%. 3.15@3.20
" 74%. 3.15@3.20
" 77%. 3.25@3.37½
Sal, English. 1.17½@1.20
" American. 1.10@1.15
Nitrate. 1.80@1.85
Prussiate. 17½@18
Phosphate 7@18
Stannate 8@15

**Strontium**—Nitrate, ℔ lb. 9@9½

**Sulphur**—Roll, ℔ lb. 1¾
Flour, ℔ lb. 20
Crude Brimstone, 2s., ℔ ton. 27 00
Crude Brimstone 3ds., ℔ ton. 26.50

**Sylvinit**, 23@27%, S. F. P., per unit. 40@42½

**Talc**—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ ton. $18@$20
c. i. f. Liverpool, ℔ ton. £4 5

**Terra Alba**—French. 80@85
English. 75@80
American, No. 1. —@—
American, No. 2. 40@50

**Tin**—Crystals. 15½@16
Muriate. 8@ 3

**Vermillion**—American, ℔ lb. 61
English ℔ lb. 82@85

**Vitriol**—(Blue), Ordinary, ℔ lb. 5½@5⅝
Extra, ℔ lb. 7

**Zinc Oxide**—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb 6½@7
* Spot.

### THE RARER METALS.

**Aluminum**—(Metallic), per lb. $1.50@$2
Sheet, per lb 2.50

**Arsenic**—(Metallic), per lb. .40

**Barium**—(Metallic), per gram. 4.00

**Bismuth**—(Metallic), per lb. 2.75

**Cadmium**—(Metallic), per lb. 1.00

**Calcium**—(Metallic), per gram. 10.00

**Cerium**—(Metallic), per gram. 7.50

**Chromium**—(Metallic), per gram. 1.00

**Cobalt**—(Metallic), per lb. 6.00

**Didymium**—(Metallic), per gram. 9.00

**Erbium**—(Metallic), per gram. 7.50

**Gallium**—(Metallic), per gram. 140.00

**Glucinum**—(Metallic), per gram. 12.00

**Indium**—(Metallic), per gram. 9.00

**Iridium**—(Metallic), per oz. 7.00

**Lanthanum**—(Metallic), per gr. 10.00

**Lithium**—(Metallic), per gram. 10.00

**Magnesium**—Per lb. 4.50

**Manganese**—(Metallic), per lb. 1.10
Chem. pure, per oz. 10.00

**Molybdenum**—(Metallic), per gm. .50

**Niobium**—(Metallic), per gram. 5.00

**Osmium**—(Metallic), per oz. 65.00

**Palladium**—(Metallic), per oz. 35.00

**Platinum**—(Metallic), per oz. 20.00@25.00

**Potassium**—(Metallic), per lb. 28.00

**Rhodium**—(Metallic), per gram. 5.00

**Ruthenium**—(Metallic), per gm. 5.50

**Rubidium**—(Metallic), per gram. 2.00

**Selenium**—(Metallic), per oz. 1.80

**Sodium**—(Metallic), per lb. 2.50

**Strontium**—(Metallic), per gm. .60

**Tantalium**—(Metallic), per gram. 9.00

**Tellurium**—(Metallic), per lb. 5.00

**Thallium**—(Metallic), per gram. .25

**Titanium**—(Metallic), per gram. 2.25

**Thorium**—(Metallic), per gram. 17.00

**Tungsten**—(Metallic), per oz. 2.25

**Uranium**—(Metallic), per lb. 5.00

**Vanadium**—(Metallic), per gm. 22.00

**Yttrium**—(Metallic), per gram. 9.00

**Zirconium**—(Metallic), per oz. 65.00

### BUILDING MATERIAL.

**Bricks**—Pale, ℔ 1,000. 3.00@3.50
Jerseys, ℔ 1,000. 4.75@5.25
Up Rivers, ℔ 1,000. 5.00@5.50
Haverstraw seconds, ℔ 1,000. 5.50@6.00
Haverstraw firsts, ℔ 1,000. 6.00@6.25
Fronts, nominal, ℔ 1,000. ....
Croton. 14.00@16.00
Wilmington. 20.00@21.00
Philadelphia. @22.00
Trenton. @22.00
Baltimore. ....

**Building Stone**—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu. ft. 45@1.25
Granite, Scotch, ℔ cu. ft. 1.00@1.15

**Cement**—Rosendale, ℔ bbl. 85@1.10
Portland, American, ℔ bbl. 2.15@2.45
Portland, foreign, ℔ bbl. 2.40@2.50
Portland, " special brands 2.60@2.85
Roman, ℔ bbl. 2.75@2.90
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.25@8.50

**Slate**—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black roofing, ℔ 100 sq. ft. 4.25@5.50

**Lime**—Rockland, common, ℔ bbl. .90
Rockland, finishing, ℔ bbl. 1.10
St. John, com. and finish., ℔ bbl. 85@ .90
Glens Falls, com. and fin., ℔ bbl. 85@1.10

**Labor**—Ordinary, ℔ day. 1.50@2.00
Masons, ℔ day. 4.00
Plasterers, ℔ day. 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day. 3.50
Painters, ℔ day. 2.50@3.50
Stonesetters, ℔ day. 3.50@4.00
Tilelayers, ℔ day. 3.50@4.50
Bricklayers, ℔ day. 4.00